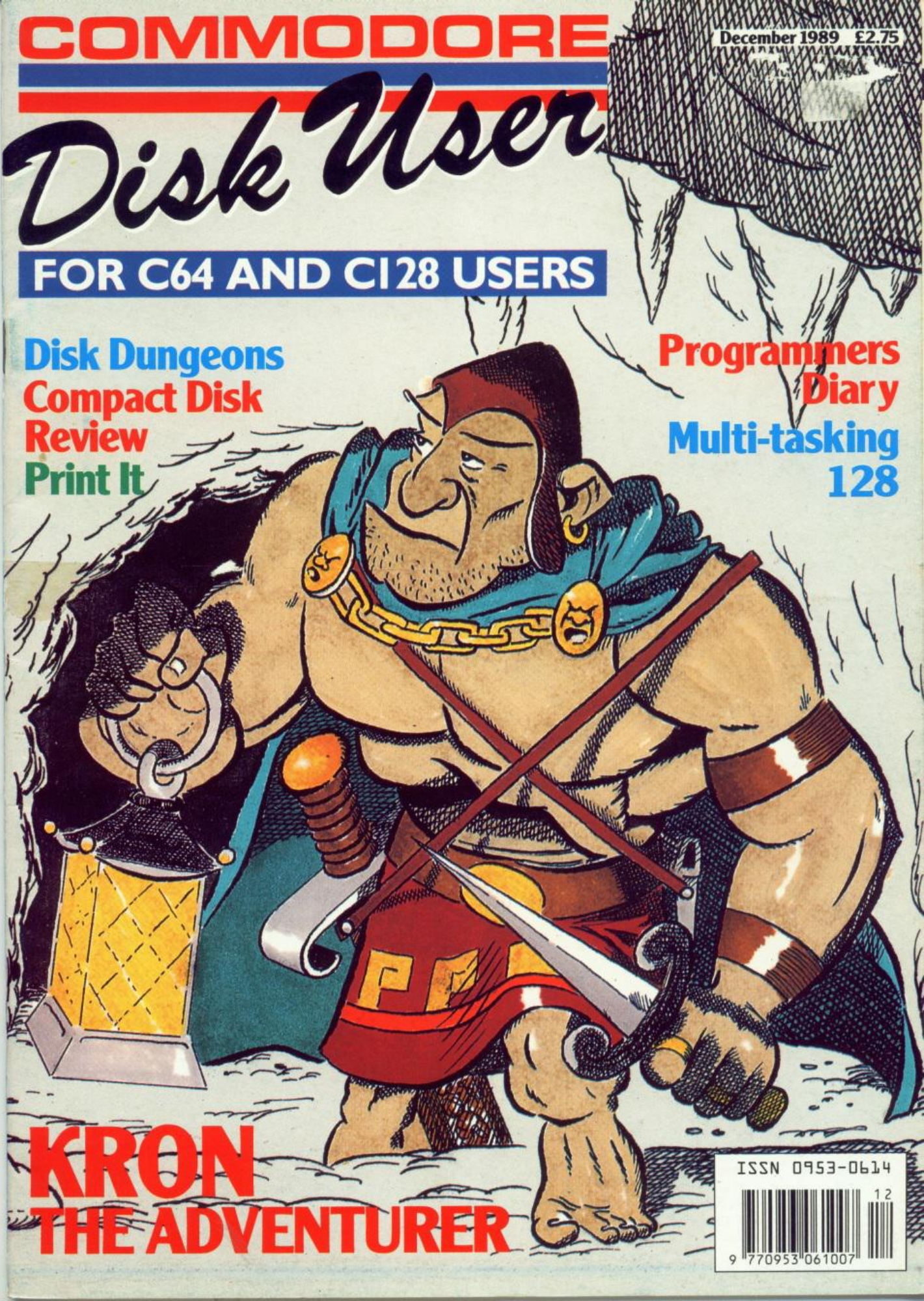
December 1989 £2.75

COMMODORE Disk User

FOR C64 AND C128 USERS

Disk Dungeons
Compact Disk Review
Print It

Programmers Diary
Multi-tasking 128



KRON THE ADVENTURER

ISSN 0953-0614

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Commodore Disk User
Volume 3 Number 2
December 1989

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ON THE DISK

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Editors Welcome

There I was, looking out of the window and passing the time of day (well I am now sitting at Stuart Cooke's old desk...!!!), suddenly I was yanked from my comfortable Editor's chair and transported to the hustle and bustle of Earls Court exhibition hall. Everywhere I looked I could see my fellow man with that glaced look in their eyes as they surveyed the scene before them.

The first question that sprang to mind was, what year is this? For all intents and purposes this could be 1985, 1986, 1987 or 1987. Yes you have guessed it, there was nothing really new at this year's **PCW** show that made it stand out from all the others.

Being a fairly intelligent sort of person, I can appreciate that the job of putting on a show of this complexity is somewhat mind bending. However, why do show organisers always insist on placing a stand that has a demonstration with spoken commentary next to one that is filling the air with 50000 decibels of music. The other major area for concern, lies with the exhibitors themselves. For companies that make their living out of selling games to computer users, at least a vast majority of them do, it was a little disturbing to see that most of them did not provide the machines or the products for people to try. Instead you got a few arcade machines and a few demos that you had no access to. (I can understand the reluctance for people to have dozens of expensive machines lying around just waiting to disappear, but Commodore's idea seemed to work well).

Apart from these little criticisms, the show wans't all that bad. Let's face it, without these shows the computer industry would fall into obvlivion???

On this months disk you will find a variety of programs to keep most computer users happy. For people that use wordprocessors we have provided you with a Basic word processing program called *QUIKWORD*. Those of you that would like to brighten up your CDU disks, or any other disk for that matter, we have provided you with DCU *MENU KIT*. People with an artistic flair will find *TEMPLATE DESIGN* to their liking. *MUSIBASIC* will hopefully make the programming of sound and music much easier. Games players will find plenty to keep them amused. For the adventurers there is *KRON* whilst those of you that like to think a little there is *PANIC*. *LIMBO* provides you with some strategy and *PHOBOS* gives you some arcade playing. Finally, for C128 owners we have an excellent article on *MULTI-TASKING* on the C128.

Disk Instructions

We do our best to make sure that Commodore Disk User will be compatible with all versions of the C64 and C128 computers.

Getting the programs up and running should not present you with any difficulties, simply put your disk in the drive and enter the command.

LOAD "MENU", 8,1

Once the disk menu has loaded you will be able to start any of the programs simply by pressing the letter that is to the left of the desired program.

It is possible for some programs to alter the computer's memory so that you will not be able to LOAD programs from the meny correctly until you reset the machine. We therefore suggest that you turn your computer off and then on again before loading each program.

How to copy CDU files

You are welcome to make as many of your own copies of Commodore Disk User programs as you want, as long as you do not pass them on to other people, or worse, sell them for profit.

For people who want to make legitimate copies, we have provided a simple machine-code file coper. To use it, simply select the item *FILE COPIER* from the main menu. The copier works with a single drive, and is controlled by means of the function keys as follows:

F1: Copy file – the program will prompt you for a filename.
F3: Resave the memory buffer – you may get an error on a save (perhaps you left the driver door open). Use this to try again. Of if you want to make multiple copies to other disks.
F5: Disk commands – allows you to enter any regular C64 disk command.
F7: Displays the disk directory.
F2: Exits the program and returns you to basic.

Disk Failure

If for any reason the disk with your copy of CDU will not work on your system then please carefully re-read the operating instructions in the magazine. If you still experience problems then:

1)
If you are subscriber, return it to:
INFONET LTD
5, River Park Estate
Berkhamsted
HERTS. HP4 1HL
Tel: 0442-876661

2)
If you bought it from a newsagents, then return it to:
CDU Replacements
Protoscan
Burrell Road
St. Ives
Cambs
PI7 4LE
Tel: 0480-495520

Within eight weeks of publication date disks are replaced free.

After eight weeks a replacement disk can be supplied from **Protoscan** for a service charge of £1.00. Return the faulty disk with a cheque or postal order made out to Protoscan and clearly state the issue of CDU that you

require. No documentation will be provided.

Please use appropriate packaging, cardboard stiffener at least, when returning disk. Do not send back your magazine – only the disk please.

Note: Do not send your disks back to the above if it's a program that does not appear to work. Only if the DISK is faulty. Program faults should be sent to the editorial office marked **FAO bug-finders.** Thank you.

BACK ISSUES

Back issues of COMMODORE DISK USER are available at $3.25 per issue, which includes postage and packing via:

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NEWS

Attendances for this year's *PC Show* at **Earls Court**, may have been higher than before but the Leisure Hall was a lot emptier and the Central Hall was almost exclusively for the IBM compatible user.

Bargain hunters were limited to buying cut-price blank disks and the odd game or two, the games section itself was heavily equipped with coin-op machines, and the whole place had the air of a market that is heading for the more serious (and higher profit margined) 16 bit environment. A lot of the fun of previous years seemed to be missing and so do a lot of the companies. **Electronic Arts, Mirrorsoft, Code Masters, Palace, Datel, Trilogic** – the list goes on. There was a time when these companies saw the Show as essential and valuable but now the world seems to have turned once more.

It is, perhaps, time for something new. The November *Commodore Show* at the **Novotel** is part of the answer but always fails to draw the big software houses. A surprise announcement at the PC Show was that next year the venue will be taken over by the *European Computer Entertainment Show*, perhaps this may prove to be the much needed solution.

The truth is that software and hardware manufacturers no longer see the individual as important. Of greater relevance, to them, is pandering to the needs of the distributors and chain stores – if you're not in *W H Smith's* or *Boots* you not on the map. Marketing goes beyond this and it's about time the 'give us your money' atitude was softened back to 'give us your money because...'

It's about time that the big manufacturers realised that the end use is the major source of income, the distribution means is merely a vehicle. The parallel in the cinema world lies in the 'bums on seats' syndrome, when the emphasis fell on the dissemination means, the quality of service to the customer fell and so did the industry. Now that cinemas are improving, so are the attendances. Computer world beware.

Show Up

The companies who were at the Show included *Ocean's* large stand with a drive-in movie theme and a large video wall to show off the forthcoming attractions, **US GOLD's** arcade extravaganza and racey red Ferrari, plus **Hewson's** black and red box of unearthly delights. **Domark** had the stand which seemed to receive a fair amount of attention, not because it was particularly well designed but because of *Hard Drive'*, the company's superb coin-op conversion.

Commodore's stand looked a little less forboding than last year and gave the feeling that Amiga is now firmly established. As for the 64C, I counted only three despite Commodore's predicton of over 100,000 sales between now and Christmas. Certainly it looks like Commodore is relying on the healthy software support of the 64C as the main sales point.

Show Offs

After-hours entertainment at the show was healthy enough for journalists and exhibitors, the general public got a meagre diet.

Hacks and backers were treated to a booze up by **Activision** and **Ocean**, and a free **US Gold** evening of entertainment, including a live performance by **Rik Mayall** (free, that is, if you discount the prices of the drinks at London's *Limelight Club*). All the public got was a poor imitation of the Ghostbuster's and a personal appearance by ITV's **Timmy Mallett** who was utterly, utterly something or other.

Maybe we're just becoming dull old hacks but we found the show one big yawn and, though the crowds came, it was apparent that no-one stayed too long.

Show Down

It always amazes the exhibitors that, no matter what precautions are taken, theft is still a problem at the show. We aren't talking of petty theft (if any theft can be called petty), we are talking major take-away sand damage. Despite **Virgin Mastertronic** security bolting their equpiment, the show team found some 'kids' trying to prise the machines off the desk, regardless of the fact that they were smashing the object of their desire.

It's not only kids that indulge in felonious acts. During the trade-only days, even the business section (over 18's only) was losing the odd bits of hardware and software. **Tulip** suffered, for example, when a thief tiptoed through the laptops and made off with a *LT-286* – well Tulip did describe it as portable!

Console Elation

It appears that, once again, next year will be the Year of the Games Console, since last year wasn't. With one exception, we still find this hard to swallow. Everyone is predicting the death of the eight bit computer but **Sega, Nintendo** and the much vaunted **PC Engine** are all based on Z80s or 6502s.

The only exception is the **Konix** which is principally a 16 bit machine but incorporates a 32 bit co-processor for speedier coin-op quality graphics. This machine is fast, very fast. Potentially, it could run rings around the Amiga for half the price. It also has the added attraction of a special rig which moves in sympathy with the game and potentially the best sound chip devised (if anyone can work out a simple way to program it). Another plus factor is that it is a British product.

Konix is a Welsh company whose principal contribution to technology has been string of ergonomically designed joysticks, now **Wynn Holloway,** the Konix managing director and Welsh wizard, has to conjour up the finished product ready for a November launch. The Konix products at the show still looked as though they had a long way to go and, knowing what a drain on resources such a project means, failure to market by Christmas could mean the death of the Konix project.

Hi-tech Society

We always think of our readers as being the potential software authors of the future. This means that several will eventually find themselves faced with a contract to sign and this is when the problems can start. Almost all of the professional programmers around

today have been ripped off in some way but these days may soon be left behind. It all depends on the *Success of the Society of Software Authors.*

The aim of the SSA is to offer help and advice on the whole area of life as a software author. Whether you're a graphic artist, programmer, musician or game design (in fact, anyone with anything to do with the writing of games) the SSA can offer advice on contracts, lawyers, good or bad publishers, real ale, and a whole range of excuses for late delivery (most of which relate to real ale). The aims are serious but with **Jon Dean** involved a touch of levity is injected a the appropriate moment.

Mev Dinc, co-founder of the Society, said, "Through the SSA I believe that we can achieve the aims that we have set out but this is only possible with a strong membership." The idea for the SSA was mooted at last year's PC Show but the organisation has only formally existed for a couple of months and already has around 60 members. Further details can be obtained from The Society for Software Authors, 6 Callow Croft, Rurbage, Wiltshire SNB 3TB.

Chess Wars

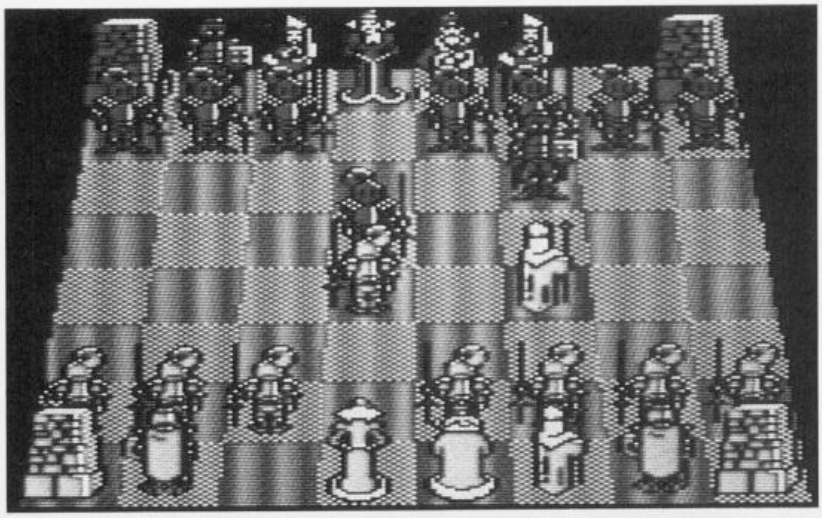
All work and no play is definitely dull but the problem is where to find some intelligent entertainment in a coin-op dominated, shoot-em-up world. **Electronic Arts** is often a good source and their latest release promises to be excellent.

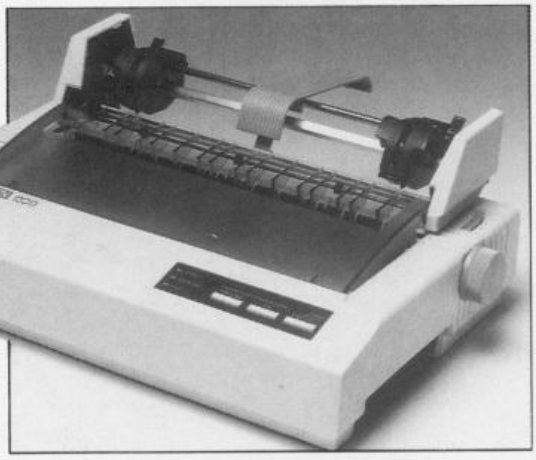
Battle Chess has already appeared on 16 bit and received rave reviews. As far as we can tell, the only eight bit version is the new C64 disk-based version. At £14.99 this all action chess game is challenging, amusing and worth studying as an example of how a computer game should be conceived.

Bar Stick

Spectravideo's latest game controller breaks with the company's traditional *Quickshot Turbo* design. The new stick is more like a real stick or, more accurately, it's like a motorbike handlebar.

The new *QS 129 Flight Controller* costs £12.50 and the more conventional Turbo has been lowered to £10.50.





BATMAN™

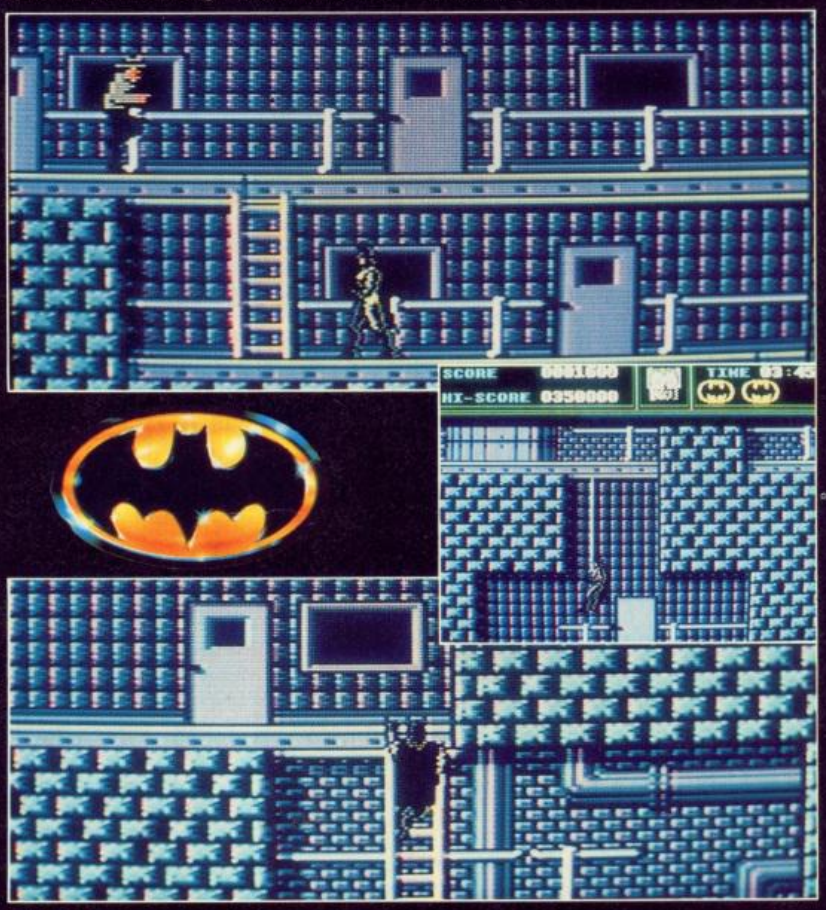
Mild mannered **Bruce Wayne** isn't just a multi-millionaire and chairman of the Wayne foundation, as when night falls and crime grips the streets of Gotham City he turns into the masked vigilante **Batman**. As the game begins Gotham's biggest crime ring is headed by **Gus Grissom** and his psychotic right hand man **Jack Napier**.

In the first of five levels that follow scenes from the film, Batman has cornered Napier in the Axis chemicals plant and must first take care of his henchmen before tracking down Jack Napier. This involves negotiating a series of ladders and ramps (yes platform games are back!) while avoiding the guns and bombs that are hurled at you. To help, you have the Batrope that you can hook on and climb up or swing Tarzan style from one platform to another. When you finally corner Napier he falls into a vat of chemicals that distorts him both physically and mentally as he becomes **The Joker**.

Levels two and four are both driving games in which you get to drive the batmobile and fly the Batwing while avoiding the Jokers cars and the police since they still aren't sure whose side you're on. In level two you're making good your escape after rescuing **Vicky Vale** from the Joker's clutches and in level four you're back to foil the Joker's masterplan. This involves killing thousands of people by releasing deadly gas from giant balloons. Your job as the Caped Crusader is to cut the ropes and release the balloons without bursting them.

The final battle between Batman and the Joker finally comes in level 5 and is similar in style and gameplay to level one. This time you are high above Gotham City on top of the Cathedral and have to look out for crumbling floor boards and rapid rats while picking off his henchmen before having the last laugh on the Joker.

Wait a minute, I hear you cry! You've missed out level 3. OK, if you insist, level three is basically Mastermind. You gave to actually use the Batcomputer to discover the components that together form Smilex, the Joker's killer gas. There, you were happier when you didn't know.

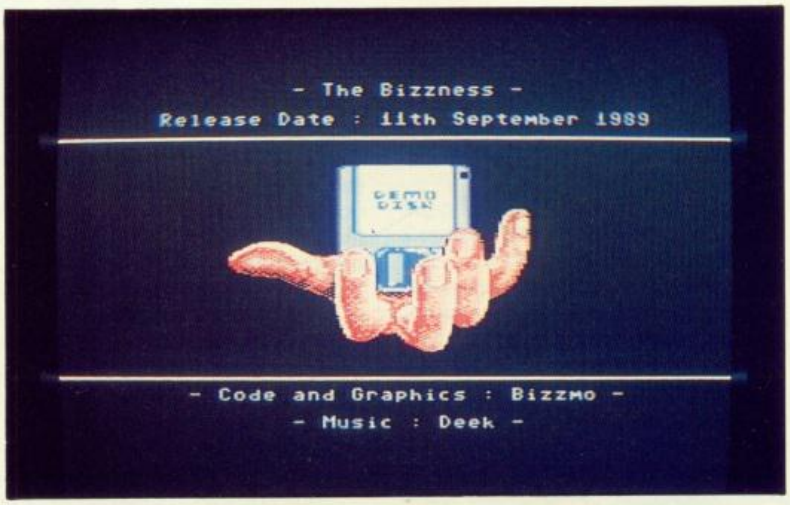


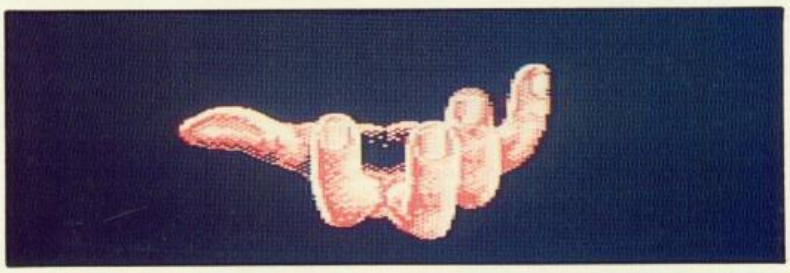
Title: Batman
Supplier: Ocean, 6 Central Stret, Manchester, Tel:061 8326633
Price: £12.99
Graphics: The best part of the game.
Sound: No surprises in the music or sound effects.
Playability: Quite easy to learn.
Addictiveness: Levels 1 and 5 are the best.

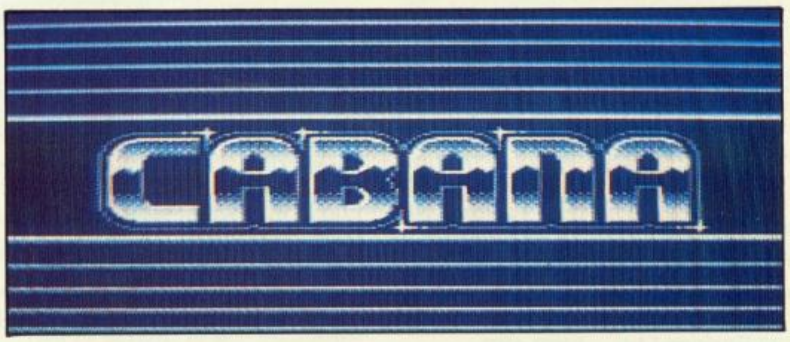
IDEAS TO WORK BY

If you are always short on ideas for your programmes, read on and discover what is possible

By A. Partridge







When you are writing a program, the most important thing is PRESENTATION! It's no use whatsoever having a brand new idea for a game, then wasting it with poor graphics, sloppy presentation and no effort put into playability. This is what this *'Ideas to work by'* is all about.

If you look at a screen, and you see flickers where a scroll is, or where character sets are changed, people think 'Yuck!' and it gives a bad impression of your product straight away. Lesson one then is: Take time to remove small glitches and flickers, no matter how small they are!

People like colour. Use lots of colour in your presentation, unless it is either inappropriate, or not possible (memory wise, or technically not possible). 'Colour Bars' (as shown in my article *'Raster Routines'* last issue) are a good method of dividing up a text or menu screen. Some demos of the various sorts of colour bars, and some of their users are on this month's disk.

Colour 'Fades' are another method of brightening up boring static text. This is shown at the bottom of the *CABANA* logo demo on the disk. Blue colour bars are also used to 'Bring the logo out of the screen'. Highlighting important parts with movement of colour works. Try it.

If you are not using sprites for anything else, putting a sprite movement behind text on a screen is a quick and neat way of livening it up! I used this technique in a demo of mine, by putting a spinning circle behind the text on the screen, added a colour fade through the sequence, and it looked a lot better!

That's it for this issue, next time I will either go into graphics techniques (with lots of help from Bizzmo!) or do some information on coming up with game and utility idea's. Happy programming.

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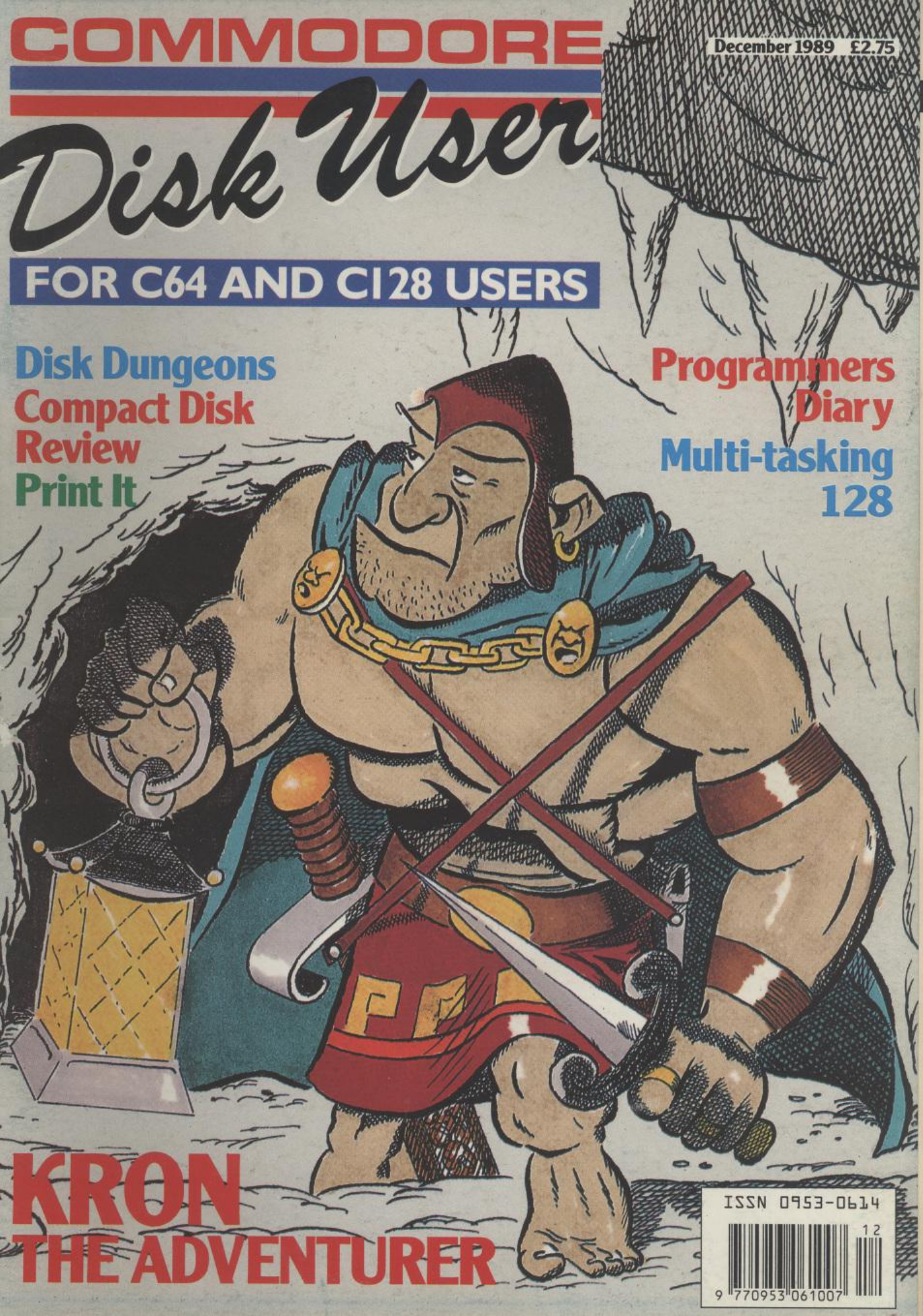

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ISSN 0953-0614

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A powerful BASIC-Toolkit (Additional helpful commands) that considerably simplifies programming and debugging.

AUTO	HARDCAT	RENUMBER
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COLOR	HEX$	SAFE
DEEK	INFO	TRACE
DELETE	KEY	UNNEW
DOKE	PAUSE	QUIT
DUMP	PLIST	MONITOR
FIND	ILOAD	BLOAD

RENUMBER : *Also modifies all the GOTO's GOSUB's etc. Allows part of a program to be renumbered or displaced.*

PSET : *Set up of printer type.*

HARDCAT : *Prints out Directory.*

The toolkit commands can be used in your programs.

DISK TOOL

Using POWER CARTRIDGE you can load up to 6 times faster from disk.
The Disk commands can be used in your own programs.

DLOAD	DVERIFY	DIR
DSAVE	MERGE	DEVICE
DISK		

MERGE : *Two BASIC programs can be merged into one.*

DISK : *With DISK you can send commands directly to your disk.*

TAPE TOOL

Using POWER CARTRIDGE you can work up to 10 times faster with your data recorder. The Tape commands can be used in your own programs.

LOAD	SAVE	VERIFY
MERGE	AUDIO	

POWERMON

A powerful machine language monitor that is readily available and leaves all of your Commodore memory available for programming.
Also works in BASIC-ROM, KERNAL and I/O areas.

A ASSEMBLE	I INTERPRET	S SAVE
C COMPARE	J JUMP	T TRANSFER
D DIS-ASSEMBLE	L LOAD	V VERIFY
	M MEMORY	W WALK
F FILL	P PRINT	X EXIT
G GO	R REGISTER	$ DIRECTORY DOS Commands
H HUNT		

PRINTERTOOL

The POWER CARTRIDGE contains a very effective Printer-Interface, that self detects if a printer is connected to the Serial Bus or User-Port.
It will print all Commodore characters on Epson and compatible printers.
The printer-interface has a variety of set-up possibilities. It can produce HARDCOPY of screens not only on Serial printers (MPS801, 802, 803 etc) but also on Centronic printers (EPSON, STAR, CITIZEN, PANASONIC, etc).
The HARDCOPY function automatically distingishes between HIRES and LORES. Multi-colour graphics are converted into shades of grey. The PSET functions allow you to decide on Large/Small and Normal/Inverse printing.
The printer PSET functions are:

PSET 0 - *Self detection Serial/Centronics.*
PSET 1 - *EPSON mode only.*
PSET 2 - *SMITH-CORONA mode only.*
PSET 3 - *Turns the printing 90 degrees!!*
PSET 4 - *HARDCOPY setting for MPS802/1526.*

PSET B - *Bit-image mode.*
PSET C - *Setting Lower/Upper case and sending Control Codes.*
PSET T - *All characters are printed in an unmodified state.*
PSET U - *Runs a Serial printer and leaves the User-port available.*
PSET Sx - *Sets the Secondary address for HARDCOPY with Serial Bus.*
PSET L1 - *Adds a line-feed, CHR$ (10), after every line.*
PSET L0 - *Switches PSET L1 off.*

POWER RESET

On the back of the POWER CARTRIDGE there is a Reset Button. Pressing this button makes a SPECIAL MENU appear on the screen.
This function will work with any programme.

CONTINUE - *Allows you to return to your program.*
BASIC - *Return to BASIC.*
RESET - *Normal RESET.*
TOTAL BACKUP DISK - *Saves the contents of the memory onto a Disk. The program can be reloaded later with BLOAD followed by CONTINUE.*
RESET ALL - *RESET of any program.*
TOTAL BACKUP TAPE - *As BACKUP DISK but to TAPE.*
HARDCOPY - *At any moment, prints out a Hardcopy of the screen. Using CONTINUE afterwards you can return to the program.*
MONITOR - *Takes you into the Machine language Monitor.*

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Print it

Tony Hetherington loads up his arsenal of business graphics packaged and gives us a glimpse of their capabilities

One of the main advantages of owning a disk drive is gaining access to software from across the pond. However, alongside the **Infocom** adventures and **GEOS** utilities you'll find a group of software known over there as **Productivity software** and largely ignored over here. In our first visit into this world we'll discover different ways to get your name in print that will uncover utilities with applications as diverse as producing full newsletters to printing badges.

This round up will begin with the C64's quartet of reconised desktop publishing programs and then cover a variety of packages with specific uses that may suit your needs more than a full DTP system. For example, if you want to print greetings cards and poster invites then perhaps *Printshop* would be better.

To use these programs you will of course need a printer which could be anyone of the wide range of dot matrix printers. However, if you are yet to make the printing plunge, this may be the right time as the popular workhorse *Star LC-10* has now dropped in price to only £199.

GeoPublish

GeoPublish is regarded as many as the C64 DTP system as it offers the most flexibility and selection of text and graphic options. The reason for this lies in two utilities supplied on the GeoPublish disk. The first is a text grabber that can read and convert any C64 word processor file to be used in your DTP document. The second provides the graphics as it can grab clip art from Newsroom and Print Shop disks to supplement the images created in the companion GEOS program GeoPaint.

GeoPublish then provides a simple to use way of combining the text and graphics into pages that form your document, whether it be a business report or club newsletter. GeoPublish speeds up the operation by representing text on screen as rippled patterns and only fills in the actual words if you view a magnified part of the page or print it out. GeoPublish, of course, benefits from being part of the GEOS system and can use any of the GEOS fonts to give it the most comprehensive range of text styles and point sizes on the C64. If you can't find one you want in all the available fontpacks then you can design your own with the GeoFont utility. Lookout for more on GEOS in the next issue of Commodore Disk User.

Supplier: Berkeley Softworks (F.S.S.L.)
Contact Number: 0386 553153
Price: £39.95
Advantages: Can use all C64 word processors, grab graphics and add GEOS fonts.
Disadvantages: Must have GEOS to use it. No clip-art.

Paperclip publisher

PaperClip Publisher is a DTP program with a lot of pedigree as it's programmed by **Gold Disk**, the company behind Amiga packages *Pagesetter* and *Professional Page*. In fact, this program could be throught of as the C64 version of Pagesetter, as it uses the same basic mechanics. The most important component of Paperclip Publisher is the box that can be defined to any size or shape and repositioned anywhere on the page. For each box you can control its contents by determing whether it will contain text or graphics and the background and border it will have. If it is to contain text then the typeface and point size can be selected from the limited options. With a minimum point size of just 8 point you won't get too many words to a page.

This system takes a little getting used to but you'll soon get used to it as to create a newsletter you would have a box for the headline, a box for each story, a box for each story headline and a box for each graphic that can be selected from the programs library of clip-art. However, don't expect to rush into print with this package as it is remarkably slow as it tries to write every word on every page, no matter how small which can bring things to a near standstill if you're in full page preview. The way round this is to leave filling in the text to last.

Supplier: Gold Disk (F.S.S.L.)
Contact Number: 0386 553153
Price: £34.95
Advantages: Easy to use. Good clip art library
Disadvantages: Slow. Only supports the PaperClip word processor.

Newsroom

Newsroom is a curious program that offers both the best range of clip-art but also the most limitations on the style and size of text you can use on a page. In fact, it supports no word processors, meaning that text files can't be written in advance and then loaded in, instead the words must be typed directly onto the page. Obviously, this means you must do without word processor features such as spell checkers and a thesaurus in writing your stories. Having said that it also means that there are no box shaped limits restricting where you can place text and graphics.

Newsroom is a beginners DTP program and splits itself and the DTP task into departments. First the banner is created which includes the newsletters headline along with any graphics that you want included. In the photo lab you can load in and cut to shape pictures from the clip-art library that includes line drawings of aliens and animals, dogs and frogs and maps and men and then move to the layout dept to position it on the page. The Copy desk is the place to add text to the page in only five different styles, and finally it is all printed out at the press.

Supplier: Springboard (F.S.S.L.)
Contact Number: 0386 553153
Price: £24.95
Advantages: Easy to use. Extensive clip-art library.
Disadvantages: Doesn't support word processors. Only five styles of text.

Stop press

AMS Stop Press, now owned by **Database** is the only C64 DTP program that is supplied with a mouse. This is used to access its pulldown menus and to move and position clip art graphics on the screen. Apart from its extensive clip art library and ability to convert and use Newsroom and Print Shop graphics, its 50 text fonts and font designer Stop Press's main claim to fame is the way it allow you to flow text onto a page without the need for boxes and borders. Instead the text will flow into any space it finds and around any graphics. Therefore you can flow text around maps and graphics and also control it with lines and curves added through the programs drawing utilities.

Supplier: Database
Contact Number: 0625 878888
Price: £??.??
Advantages: flow text around graphics. 50 fonts. Clip art library
Disadvantages:- Each page is created and saved individually. More expensive than the others.

Print shop

Through a series of easy to follow menus *Print Shop* allows you to quickly create a range of print outs including greetings cards, flysheets and banners. Whatever the style of print the mechanics are still the same as the print is constructed from a selected border pattern, style of text and graphics selected from the extensive clip art library. The graphics can be printed in three different sizes and patterns to quickly produce some pleasing results or you can use one of the preset designs, such as of a christmas card for rapid results.

Supplier: Broderbund (F.S.S.L.)
Contact Number: 0386 551153
Price: £29.95
Advantages:- Simple to use
Disadvantages:- Restricted number of designs and variations.

Certificate maker

If you read the review of *Award maker* last issue and are thinking that you need such a program but it won't work with your printer then fear not as this is the program for you. Essentially, it's

the same idea but this is the cheap and cheerful version.

Supplier: F.S.S.L.
Contact Number: 0386 553153
Price: £19.95
Advantages:- Works with most dot matrix printers.**Disadvantages:-** The print quality isn't as good as Award Maker.

Billboard maker

If it's worth printing, it's worth printing big! That's the philosophy behind *Billboard Maker*, as it's an utility that enlarges standard 8½" x 6½" output to an impressive 4 by 3 feet! Any output from a C64 graphics package such as *Doodle, Koala Pad* and *Computer Eyes* can be read into Billboard Maker where it can be enlarged, flipped, reversed and cropped before printing out in stick together sections. You can also ehance the image by adding text and touching up graphics and even smooth ragged edges with the programs optimiser.

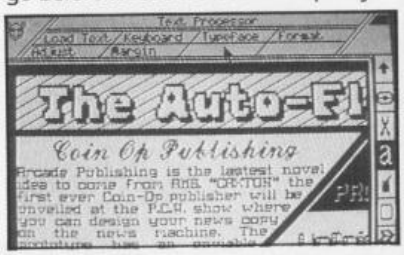
Supplier: F.S.S.L.
Contact Number: 0386 553153
Price: £19.95

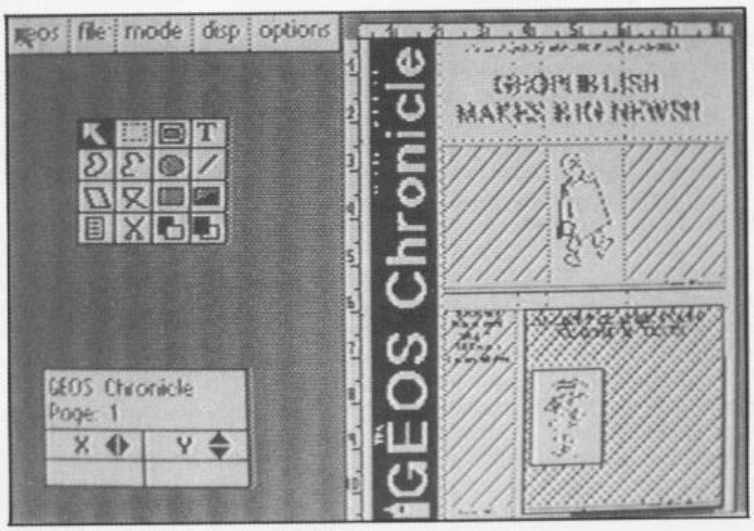
Advantages:- Signs and posters can be blown up to display size.
Disadvantages:- Above is printed in A4 sections that must be stuck together.

Photo finish

Another utility that this time enhances output from graphic and DTP packages up to a level that the authors claim is near laser quality. Images from most packages including *Print Shop, Newsroom, Billboard maker, Blazing Paddles, Computer Eyes, Doodle and Koala*, can be loaded into the system and altered using the colour editor and then enhanced by a combination of grey scaling (substituting colours with shades of grey) and optimising to fill in badly drawn circles and rough edges.

Supplier: F.S.S.L.
Contact Number: 0386 553153
Price: £24.95
Advantages:- Improves printout by adding grey scales and removing rough edges.
Disadvantages:- Still a long way to go before it reaches laser like quality.





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STORM ACROSS EUROPE

In September 1945 **Hitler** launched his Blitzkrieg attack against Poland that triggered World War II and unleashed a *Storm Across Europe* that wouldn't calm for six years. Now, in perhaps the best game **SSI** has released you can refight every battle, launch and counter invasions, develop and improve weapons, send submarines to raid fleets in the Atlantic and launch air raids to bomb enemy airbases and cities. What's remarkable about the program is that you can achieve all this in an evening.

In the game you control the German war machine in a variety of scenarios, beginning at different stages of the war with 1939 being the obvious favourite. The map covers most of Europe from Sweden to North Africa and Portugal to the Urals and so your two opponents are the Allied forces of France, Britain and Poland and the Soviet Union. These can be controlled by either fellow human commanders or by computer opponents. By adjusting a series of levels you can bias the game in your favour or make it even tougher.

As the game begins your forces are poised for the attack on Warsaw. If you seize this city then Poland will fall and will be split equally between you and the Russians. At the moment Britain and France will enter the fray and the war will begin.

Storm Across Europe is played in a series of turns representing the four seasons of the year with each turn including a land, naval and air phase. The land hase is the backbone of the game with the other two acting in supporting roles. Each turn you can move your armies any distance through your own territory and then attack up to three enemies areas. This number depends on the season (for example, only one attack is allowed in the cold thaw of spring but three in Summer) and whether subsequent attacks succeeded. Each army actually consists of troops, tanks, paratroopers, air support and supply trucks. If supply is short of cut off then the troops will fight well below their best.

The most obvious naval operation is in launching amphibious landings and convoying troops and tanks across waterways. For this you need enough landing craft and escort ships to carry the army and enough fleets in the area to challenge the enemies naval strength. If this is too strong then the invasion force will turn back. Submarines or U-boats are particularly important to the German player as they will not only hunt and kill enemy fleets operating in the many seas that surround mainland Europe but also attack supply ships coming from the USA.

Each area of the map contains some industrial, raw materials and population resources that are accounted every Spring and are used to decide the resources available for research and production. This is why submarine and fleet raids in the Atlantic and bombing raids are essential as both these can cut the resources available to the enemey.

Deciding the balance between research and production is one of the most difficult aspects of the game, as the decisions you make will determine the course your war effort will take for the next year. To research improvements in your forces you must pour resources into each type (i.e. there is a separate research group for bombers, fighters and anti-aircraft guns) which will determine the chance of success. The more you pour in the greater the chance of success but this will cut down the resources available for production. Success means that your technology level in that category will increase by one. For tanks and troops this will mean greater fire power, for supply trucks better efficiency, for landing craft more troops can be carried and for bombers mission. If you pile in enough resources you can even develop and use missiles and nuclear weapons.

Any remaining resources can be allocated to produce more tanks, troops, fleets, subs and planes to continue the war effort. It's up to you to decide your priorities and weigh up the relative costs of the offensive units whilst not ignoring defensive measures such as garrison troops, fortifications and new factories.

The game is entirely joystick controlled and simple to learn but tricky to master. It manages to combine both the interest of the complexities of warfare with a simpole but not simplistic game system that makes it a highly enjoyable, playable and challenging game. It also provides a useful insight into the Second World War such as the weakness of Britain in the early 1940's and the horrendous casualties suffered by both sides during an invasion of Russia.

Kron

Rescue the Princess and save the land in this magical tale set in bygone days

By Tony Rome

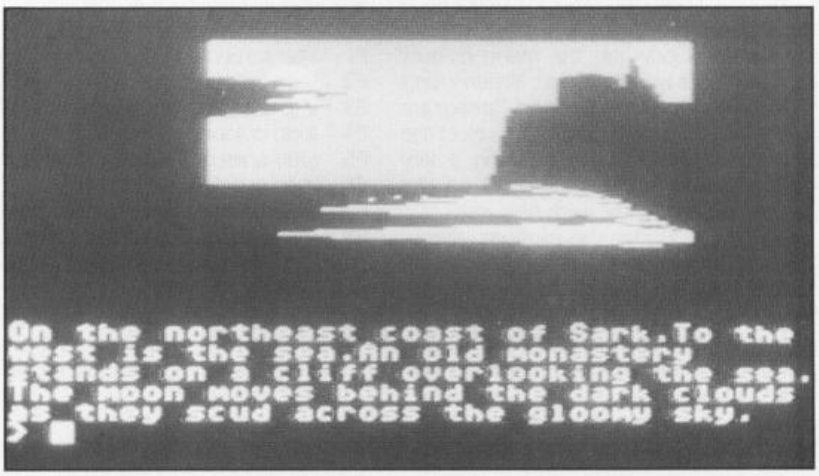
A battle rages in the city of Bora in the land of Sark. The peaceful Borans are no match for the Zeldan guards who, led by Balzan the sorcerer, demolish Bora and capture Princess Zora. Defeat had totally demoralised the Borans who, being so few in number now, had scattered and dwelt in secret caves somewhere on Sark.

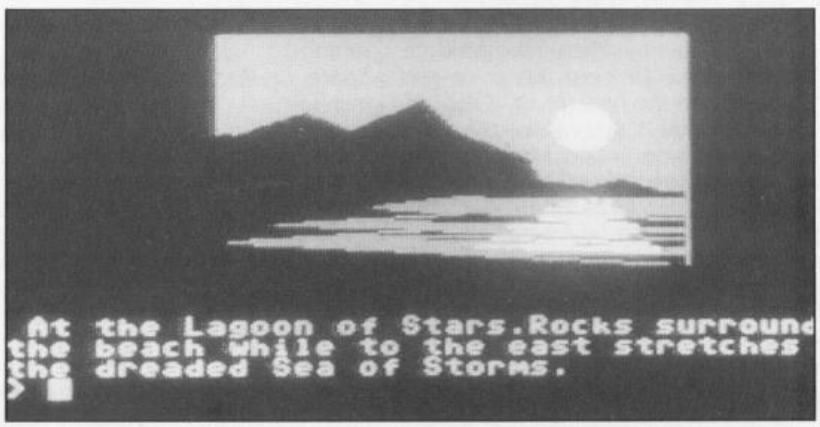
Only you, **Kron**, with the aid of your wounded father, escape across the sea of storms to a small island where you grow tall and strong and vow revenge to your people. Your promise is to kill Balzan and rescue Princess Zora by.....That day has now come!

Adventure games allow the player to use skill and imagination within the constraints of the program. The real beauty of this is that the choice is up to you! When you see the word 'instructions' enter your command. The following list shows you some of the more often used commands. (There are more, so trial and error is a good ploy!).

Take/Get – to acquire an object.
Drop/Leave – to discard an object.
North/South/East/West – (N,S,E,W) for directions.
Look-to – view your present location.
Text/Words – allows you to follow the adventure with text only.
Pict – enables you to view pictures and text.
Help/H – may or may not prove to be helpful.
List/Inv – describes all your current possessions.
Save – allows you to save your current position within the adventure
Load – loads a previously saved adventure.
Quit – the easy way out when a solution is not forthcoming.

One feature of 'Kron' is the ability to make fairly complex commands. For example 'Take the spade and throw it at...' Good luck with your quest!





Menu Kit

Provide your own colourful menus for all your CDU and normal disks

By Nell Higgins

This menu kit was designed specifically for **Commodore Disk User**, and will provide a fast and easy way for users to load the programs on each CDU disk.

To create a menu is a simple process. Load the directory, select each program, enter its type either Basic or Machine Code, set the menu colours and then save the menu. When using the menu you simply **load "program name",8,1** and once run you select the required program by pressing a key from A-Z, which is displayed on the menu to the left of each filename.

Whilst using the options menu, should you ever make an error or wish to change your mind then pressing the run/stop key will usually abort and return you to the main menu. The following are the list of options open to you.

Load Directory

This is where you will choose each file on the current directory that you want in the menu. When prompted to 'include' the file press 'N' for no and move onto the next file or 'Y' for yes. If you choose 'Y' you will then be asked for the file type, Basic or Machine Code, which in the case of Machine Code you will need to supply the start address. This can be entered either as a decimal number or a hex number (preceded with the $ sign), whereas a Basic type means a normal load file which will be RUN on completion of the load. The menu can accommodate up to 26 programs, and if this number is reached a message will be displayed informing you of the fact and you will return to the main menu.

View/Colours

Select this option to see the menu and set up all the colours. You will see that the screen is split with the top half containing a CDU logo with the menu in the bottom half. There are quite a number of options available to you from this menu and all are accessed by a single key stroke. To recap on what is available, pressing the 'H' key will display a help page. If you experiment and watch the effect on screen, you will see what action each key provides. The keys available are as follows.

F1 – alter screen colour (top half).
F2 – logo colours (CDU letters only).
F3 – alter border colour (top half).
F4 – logo colours.
F5 – alter screen colour (bottom half).
F6 – menu card colour.
F7 – alter border colour (bottom half).
F8 – menu shadow colour.
S – logo colour speed (CDU letters only).
D – logo colour direction (CDU letters only).
* – set border/screen colours to bottom screen colour.
H – display help page.
R – remember all colours and settings.
Shift/D – logo colour direction.
Shift/S – logo colour speed.
Shift/R – unremember all colours and settings.
Space or Run/Stop – exit to main menu.

Title Menu

You can give the menu any title you want, such as, CDU volume 12 etc, or a copyright message, this will appear in the top line of the menu.

Save Menu

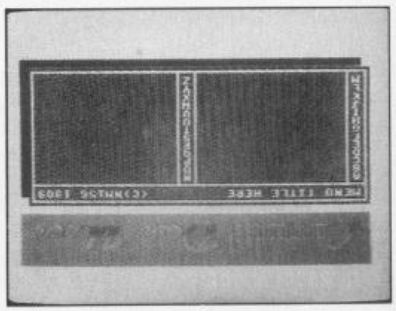
Saves the menu to the current disk, just enter a filename and voila! To reload the menu outside the kit, use a forced load such as **LOAD"name",8,1**. To move the menu program to the first position in the directory, you will have to use a disk directory editor, having done so the menu can be more conveniently reloaded by entering **LOAD"*",8,1**.

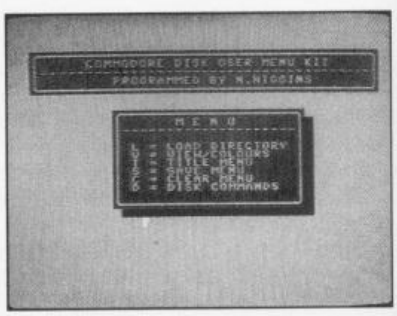
Clear Menu

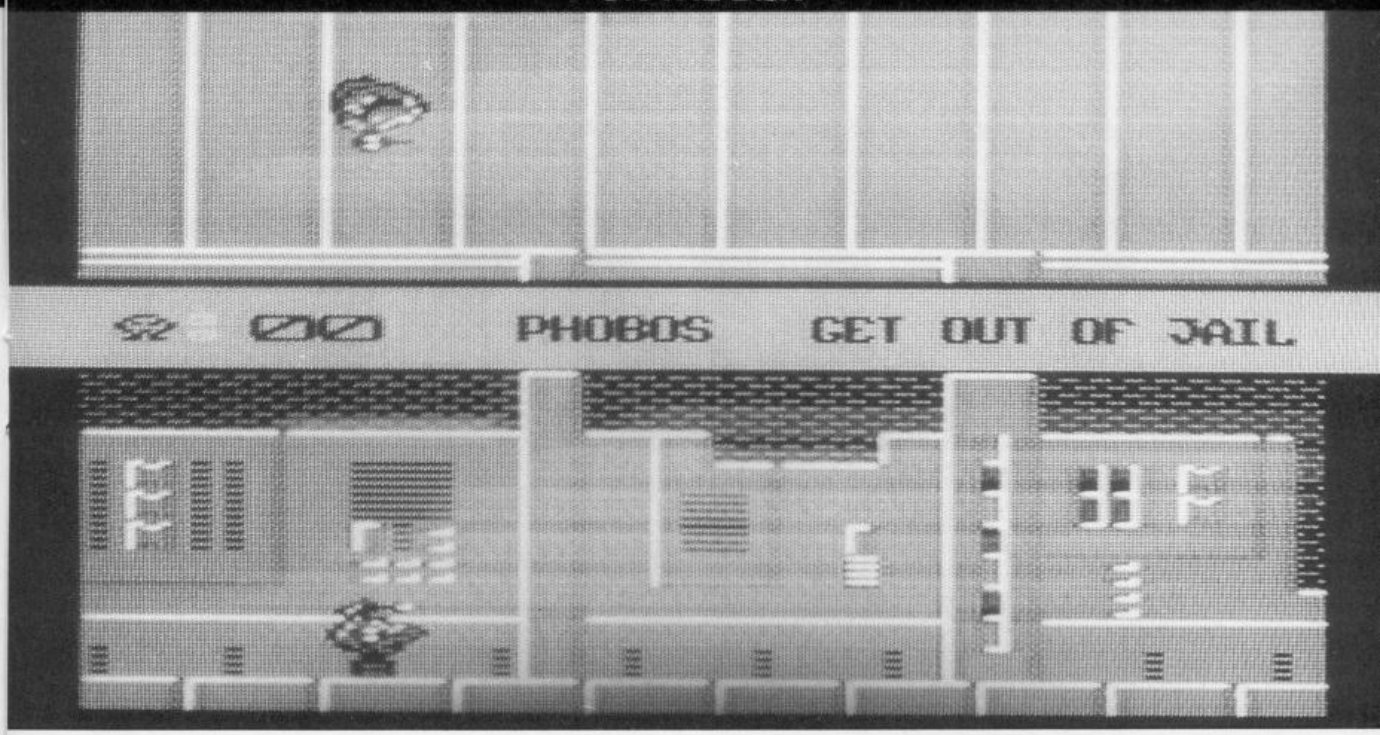
This will do exactly as it says and although you do not really need this option, I have included it for completeness.

Disk Commands

Sends a disk command to the disk drive. (Note: all disk operations are set to device number 8). Therefore SO:TEST would scratch the file called TEST. All other normal drive commands are catered for.







Phobos

get out of jail 'X'

Don your mask, clip your wings and use your skill to break out of prison.

By Nick Summer

Here you are, a harmless wimp of a guy that controls a walking/flying machine. So whats wrong with that? Well, unfortunately you are locked away in Jail 'X'.

Now, for some people this might be just fine, but not for you. No sir, your only ambition now is to break out and regain your freedom.

In order to achieve your ambition you will have negotiate four levels of aliens, which get more and more devious the further you go.

The screen is split into two different views, the top view being overhead and the botom being a view from the side. In order to destroy an alien you must align both top and bottom views of your craft to an approaching alien. On level one you must destroy 20 aliens. Level two 30, level three 40 and on level four 50. When you have managed to do this, you have succeeded in breaking out. Whenever you start a fresh level, remember where you were teleported into it (both top and bottom). This is where your exit will be.

There are no 'lives' in the normal sense, but every time you hit an alien or the bomb, your score will be reset to zero and you will start again. (on the same level) To stop playing, simply press the 'Restore' key and the title page will appear. When you restart, you will start from the level that you quit from, but with a score of zero.

Joystick control changes slightly depending on whether you are flying or walking. If you are walking, joystick left moves your top screen man up (ie to the left), joystick right moves yor top screen man down (ie to the right). Joystick up moves your bottom screen man up to flying position, and joystick down moves your bottom screen man down to walking position. If your bottom screen man is already flying then joystick up and down change slightly. Joystick up moves your bottom screen man higher and faster, and joystick down makes your bottom screen man loose height and slow down or land. You may find the control difficult at first but perserverence will prove beneficial.

Diary of a Programmer

Our intrepid diarist continues with his saga

By Andy Partridge

In the last issue of CDU (November 1989) I gave you a brief look into the mind and working schedule of a modern day programmer. I now continue with this mammoth task. (Why did I ever agree to this in the first place???)

Day 16

Remember that '16 colours in a 8x8 Hires character' program I was telling you about? Well, I have now got the editor for it (V1.0) coded by Black-Mail (Great people!) so contact me (SAE!!!!!) if you want it!

Spent a day inventing some more raster-bar colours for this demo, as I gave most of mine away with the raster article in last months issue! Got some nice purple ones for bordering, and a nice 'Large Pipe' for something else.

Day 17

Re-coded the info bit. Didna like the plain text screen and scroll, and putty in a bordering text scrawly page with a logo type thingy instead. Pressing +/ – flops through the pages. Much nicer. Very shiny. Mucho Kosher. No more cider good nigh... ZZZZZzzzz.....

Day 17 (Part Two)

The management would like to apologize for the last entry. It seems the writer of this diary had one drinkypoo's too many and then sat down to code a demo part. The offending part will, of course, be re-coded or face possible removal.

Day 18

Bizzmo and myself spent some time drawing up the final idea plans for all the parts (See seperate section!). There should be three main parts to the demo, plus an information section and an intro; therefore giving six in total. This means I can now start the main bulk of the coding: taking each of the parts and linking the music, graphics and code together, plus the block-shift-and-run routine (Explained later!)

Day 19

Took the good Bitmap (The one with T'Tits!) and added a scroll which has three different sequences of colours through it (At once!) to give a very nice fade effect! Explained how it was done to Bizzmo so he could design a character set for it!

I am going to be doing an **Idea section** in CDU soon, with idea's and explainations on how to do some of the effects I come up with in more detail... Could be fun!

Day 20

My girlfriend has gone on holiday for a week (Sniff, Sob) so I will probably be coding and writing all week (Except when I'm out on the Pop!). Did some research and some drawing for my first idea's page. Presentation is the theme, so I had to go through a lot of my own work, and other peoples, to see what looks good and what doesn't. After all that, I sat down to compile a few screen shot display programs, and some text to go with it.

Day 21

Bizzmo sent his text for this issue to me today, and I added it to this and made a screen-shot disk for CDU, so you can see some of the demo as it is so far! (Lucky you....!)

Day 22

Got Bizzmo's character set for the 3x3 fade routine. Had to change a lot of the scroll code, and completely change the three fade tables. It looks nice now though, so the effort of changing it was worth it. Good programming practice this: If something doesn't look right, don't keep it for the sake of it. Get rid of it, change it or anything. Don't let one small detail spoil the overall look of your product.

Day 23

Looked at Bizzmo's part for the demo! It has a hand that holds a spinning Amiga disk. Check out the screen shot for it! Coded a Sinus Routine for the Bitmap part. It reminded me of the dragon from **Space Harrier** when it was finished, so I might get Bizzmo to knock up some Dragon Graphics. I'll ask him....

[NOTE: A Sinus Routine, for those who don't know, is a routine that moves sprites around the screen in nice smooth circular pattern] More next month.

Limbo

Put your droid to good use and clean up all the cells that have been left lying around

By Steven Pattullo

The idea of the game is to clear all of the cells off each screen by moving your droid over them. You can also take your chance by activating question mark blocks, some are good, but others contain things that will hinder your progress. *LIMBO* also contains a full three channel piece of music which was arranged by **Kevin Bruce.**

The game is very easy to play as all that you have to do is clear each zone of the cells whilst avoiding the Guards and Dangerous blocks. On some screens there is a lift that will carry you to other parts of the zone. To board the lift simply press fire when you are touching it and release fire when you want to get off.

The first lift appears on Zone 1 and is represented by a spinning disk. Other than the cell blocks there are the following:

Teleporters – The first of these appears on screen 3 and is represented by a block with a smaller flashing block in the centre.

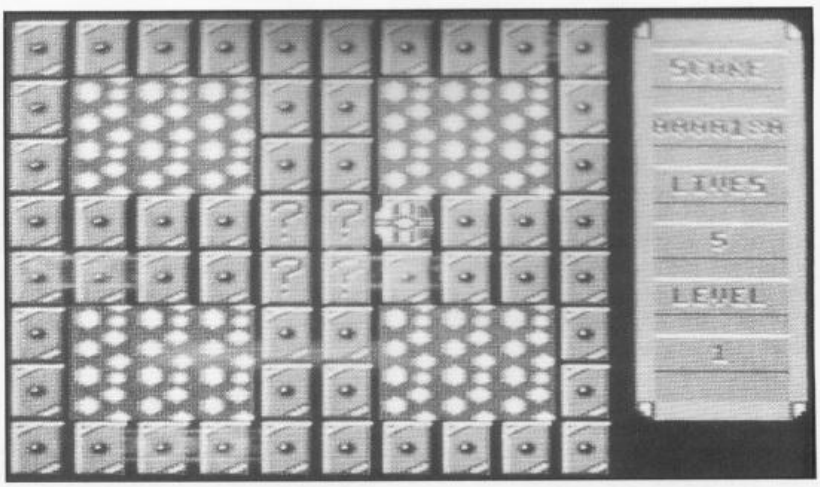
Question Marks – To activate a Question Mark move to the centre of it and press the fire button, a number of things can happen when you do this, these include: Strobe, Speed up Droid, Slow down Droid, and Warp to the next level. Question Marks can also change into other blocks.

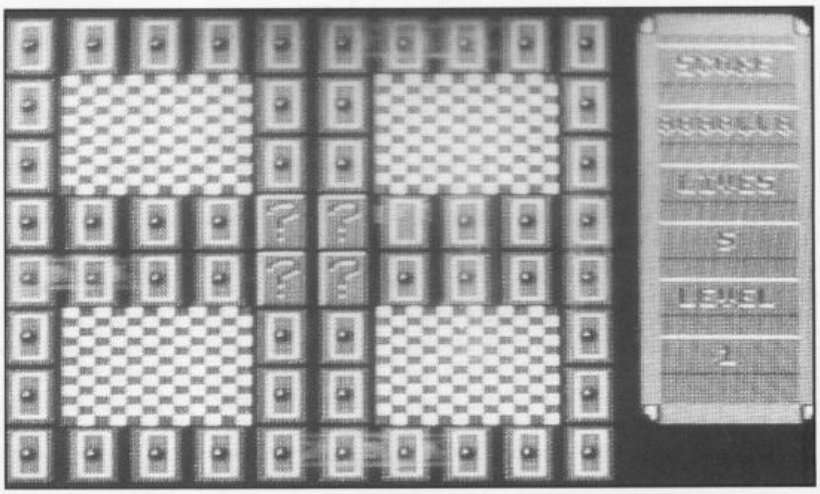
Smiling Face Blocks – Touching one of these blocks will give you an extra life.

Skulls – Touch one of these and you loose some Life-Force.

Level 7 sees the introduction of disappearing blocks.

To control your droid use a joystick in port 2. The game will end when all of your Life-Force has run out. When you are looosing Life-Force the two squares in the bottom border will flash.





Musibasic

Make your own music easily with this musical extended Basic

Fergal Moane

Judging by the amount of coverage in the computer press, most people find sound on the **C64** difficult. No doubt it is the impossible to remember numbers and mountain of POKEs that sound requires that put most people off.

This seems typical of Commodore – pack the computer with amazing hardware but totally neglect to give it software support. This is a shame as the C64 SID chip even whips the Atari ST into shape.

This article is not designed to teach you about sound generation. There are plenty of articles and books to do that. Musibasic provides an extended BASIC which will have you making acceptable music with the minimum of effort.

There are a number of points to note about the system:

1) All commands have parameters which can be variables, expressions, decimal, hexadecimal or binary numbers. Hex numbers should be preceded with $ and Binary with %. Binary numbers are exceptionally useful with sound as individual bits can be set at a glance

eg. WAVE,1,%100000001
Sets noise waveform for voice 1
VOLUME,%01001111
Sets full volume and BP filter

2) A SID register map, such as the one in the back of your manual, will be most useful for setting bits as above.

3) A number of commands have alternative forms. This helps people remember at least one form, but the commands will function in exactly the same way.

4) The code occupies $C000-$C478, leaving just under 3K free in the $C000-$D000 region. The system may be re-started at any time with SYS 49152. To avoid the screen message if you wish to use the routines in your own programs, initialise by called $C010.

5) Musibasic should be completely transparent to the C64, and all ordinary programs will work properly from within Musibasic. However, there is one small point to note. In normal Basic, the colon after a THEN statement is optional. As Musibasic bypasses the interpreter, this colon is a must. eg.

10 GET A$: IF A$=" " THEN: GOTO 10

See Demo 4 for further examples.

Musibasic User's Guide

ATTACK DECAY SUSTAIN RELEASE

Syntax: ADSR voice, AD, SR

Sets up the envelope for the specified voice. See your manual for an explination of ADSR. Note that a voice must have it's ADSR set before the waveform, or there will be no sound.

CONTROL REGISTER

Syntax: CONTROL voice, number

Allows access to the control register of the specified voice where one of four waveforms is selected, notes are gated on and off and ring modulation or synchronisation is selected. Binary numbers are especially useful here. Every note must have two accesses to the control register: the first starts the AD and the second the SR when the gate bit is off. See WAVE for further definition.

CUTOFF FREQUENCY

Syntax: CUTOFF frequency

This determines the frequency around which the filters are effective. See a manual for more information. Like pulse width, dramatic effects can be obtained by altering the cutoff frequency mid-note.

ENVELOPE

Syntax: ENVELOPE voice, AD,SR

Alternative form of ADSR

FILTER

Syntax: FILTER number

This allows access to register 23 where the top nybble sets the resonance level and the bottom nybble determines which voice is filtered. The 'fourth voice' is the external input from another instrument using the AUDIO IN socket. It allows the filtering of this external source.

FREQUNCY

Syntax: FRQ voice, frequency in Hz

This is where the actual notes are played, right from 0 to 65535 Hz. It allows scooping between notes, smooth rises in pitch and glissando. Look in your manual for frequencies for true notes on the scale. Remember that a note an octave above another has twice the others frequency. Special effects and spot effects are often discrete alterings of the frequency.

PLAY

Syntax: PLAY voice, frequency

See above for a definition.

PULSE WIDTH

Syntax: PULSE voice, width

This allows the width of the pulse wave to be adjusted between 0 and 65535. This is the most flexible waveform, and therefore must have a pulse width set. Unless a pulse wave is selected for this voice, it will have no effect. The best effects result from altering the pulse width during a note's life. This can produce a pleasing wah-wah effect.

QUIT MUSIBASIC

Syntax: QUIT

QUIT will restore you to normal BASIC and make the commands unobtainable. It does not corrupt memory in any way, so SYS 49152 will restore Musibasic and your Basic program will be intact.

All together now 1, 2, 3. It's as easy as A, B, C.

CLEAR SOUND CHIP

Syntax: SIDCLR

Clears the chip by setting all registers to zero. This should be used at the start of a music program or if the noise waveform 'locks' other sounds.

SOUND

Syntax: SOUND voice, AD,SR, freq, wave

This combines three commands and sets all parameters necessary for a sound to be generated. The volume of course should be switched on. See earlier commands for an explination.

VOLUME

Syntax: VOLUME number

Numbers from 0 to 15 select the master volume for the chip. The high nybble determines whether High pass, Low pass, Band pass, or Notch reject filters is selected. The filters are addictive and can be combined for some special effects. Use Binary to set the individual filters.

VOL

Syntax: VOL number

Same as above.

WAVEFORM

Syntax: WAVE number

This is the same as the CONTROL command. The numbers below are the ones to use for the four different waveforms.

	GATE ON	GATE OFF
Triangle	17	16
Sawtooth	33	32
Pulse	65	64
Noise	129	128

Note that waveforms can be combined, but results are not always predictable. NOISE must not be combined with anything, or the chip 'locks up'.

WIDTH

Syntax: WIDTH pulse width

Same as PULSE command

Example Programs

There are a number of demonstration programs on the disk, labelled DEMOs 1-4. Just load these with the ,8 extension as normal.

DEMO 1 Shows how effective a pulse width alteration during a note can be. Obviously, the sweep should not be so pronounced and should be written in Machine Code for the best effect. However, this demonstrates the basic (groan!!) principle.

DEMO 2 Uses the chorus effect to create the feeling of more than one instrument playing. Chorus is a slight frequency difference between notes, and if used properly it's effect can be tremendous. This example uses a +- 30Hz difference.

DEMO 3 A simple demo which shows how gliding between notes in short steps can be used for SFX in games. What would racing or flying games be like without the rising roar of the engine!

DEMO 4 This is a reconstruction of the keyboard program that you got in the back of the manual. It has been included so that beginners can compare listings to see how commands are implemented. There are a few slight differences, but note how the 'readability' of the listing has been improved by the use of proper sound commands. Feel free to change things, especially the ADSR and pulse width around lien 260.

Closing Points

Musibasic is not intended to be a beginners guide to music, but rather a tool where the experienced programmer can try out his ideas with the minimum of work. This should not put a beginner off as experimentation is the key to success. You could do with getting a decent guide to Commodore music to explain technical terms.

The example programs, simple though they are, should demonstrate what is possible. Music can be very rewarding, even more so when you have to write it yourself!

Panic

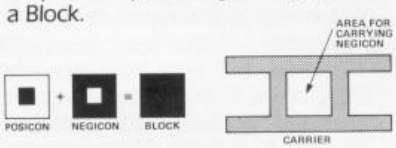
A sharp eye and a dextrious joystick hand are the requirements for this unusual game

By John Simpson

Stand by to take part in an exciting non shoot-em-up (is there such a thing?), game of skill and judgement. The idea is to cover a symbol, known as a Posicon by another symbol, which is called a Negicon to form a single unit known as a Block.

Across the top of the screen is a row of twenty Posicons. Along the bottom of the screen, above the score line, is a row of twenty Negicons. The Posicons and Negicons match each other and together they form a block.

The computer will select a green Posicon and place it at random onto the viewscreen. You must then use your carrier vehicle to select an appropriate Negicon, take it to the Posicon and drop it on top, thereby changing it into a Block.



To pick up a Negicon simply place your carrier over your selected Negicon so that it fills the carrying area, and hold down the fire button for a moment. The Negicon will change colour to indicate that it is now under carrier control-release the fire button. To release a Negicon from your carrier, again, hold down the fire button for moment. If you select a wrong Negicon you may release it on any vacant part of the viewscreen.

You score points for changing Posicons into Blocks. Some Posicons have a much greater value than others so it is wise to be choosey. Some of them have other functions. For example one of them gives an extra life.

Every now and again, a Gulper will traverse the screen at a rapid rate. This is harmless but it does gulp up any Posicons in its path. This can be useful because it creates more space for the computer to put new Posicons down. (Some of which could be very valuable).

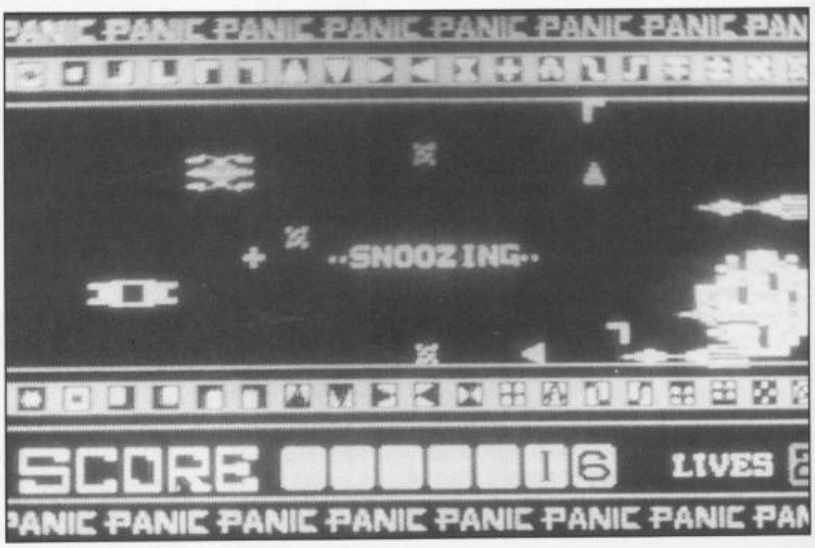
Enemy missiles also traverse the screen in swarms – one touch and you lose a life. You can destroy them with energy bolts, gaining points at the same time, but beware as some of them travel just below light speed – you may only just about see them.

To fire an energy bolt simply press your fire button and immediately release it. Be careful if you are carrying a Negicon as there is a danger that you may lose it.

The game finishes when either you lose all your lives (you lose) or you cover all the Posicons with Negicons (you win). The game is fully joystick controlled with the exception of the following keys:

F1 – Pause game
F3 – Unpause game
F5 – Turn of all sound effects
F7 – Turn on all sound effects

Enjoy the game, and whatever you do, don't Panic!



Template Design

Create your own scrolling backgrounds with little effort with this handy routine

By Dirk Lee

Template Design is a small utility which takes all the trouble out of designing scrolling backgrounds for your own games/programs.

It uses a 5 by 5 matrix of characters which we shall call 'Templates'. The main advantage of using templates is memory, because here the background is built up from a set number of repeated templates which can be stored as a single byte. For example, the background area is set at 26 by 26 templates which is a total of 676 bytes to store a complete background, including colour for each individual character. This would normally take 130 by 130 characters which is 16900 bytes and the same amount would be used to store colour, which is a total of 33800 bytes. Therefore, this utility can reduce the normal 33K required for a background down to 5 and a half K. (5K for the templates and the half K for the background).

For those of you that are interested in 'seeing' the program in memory, the following is a breakdown of the memory once the program is installed.

$0800-$0FFF Characters
$2000-22DC3 Music
$3000-$38B3 Template designer
$4000-$42A4 Map data
$5000-$5987 Template characters
$5988-$630F Template colour
$8000-$87F2 Screen designer
$9000-$9865 Menu
$C000-$CFFF Music

Locations of importance to the user are:

1. Characters $0800-$0FFF These can be designed using any character editor, but must start at location $0800. To use your own characters, simply rename your filename to "CHRS $0800" and press the number '1' on the menu to load them into the designer.
2. Map data $400-$42A4 These are the 676 bytes used to store the 'map' of the background. The program reads these to see what number template is to be displayed on the screen.
3. Template character and colour $5000-$630F This area of memory contains the 80 templates and colour for them.

Instructions

Template design

The template design allows you to design 80 templates, complete with colour using the following keys:
Numbers '1' to '4' change the character colours and background colour.
Keys '+' and '-' allow you to select the template you wish to edit.
Keys '<' and '>' select the colour for the template character colour.
Space Bar move the cursor from the character set to the template area and vice versa.
Return Key places the current character colour, depending which template the cursor is in.
'F1' jumps into the screen designer.
Keys 'L' and 'S' loads or saves a template set using the filename "TEMP $5000".

To design a template, first move the cursor over the top of the character you wish to use, then press the 'space bar'. The cursor will now be in the top left template. Now move the cursor where you want your character to be placed and press the 'return' key. You will now see your character in the left template, and the right template. The right template displays what the finished template will look like complete with individual character colour. To change the colour of the character you have just placed, move the cursor down until it is in the bottom template. The bottom template displays colours only, so simply move the cursor to the position you wish to change a colour and select a colour by the '<' and '>' keys, (top eight are single colour and bottom eight are multi-colour), then press the 'return' key to place the colour.

Screen designer

The screen designer allows you to design your 'map' with the 80 templates using the following keys.

Numbers '1' to '4' change the character and background colours.
Keys '+' and '-' allow you to select the template you wish to use.
Keys '<' and '>' move the template left or right, and holding down the 'shift' key in conjunction with the '<' and '>' key will move the template up or down.
The cursor keys will scroll the screen.
The 'return' key places the current template onto the map.
Keys 'L' and 'S' loads or saves a map using the filename "MAP $4000".

To design a 'map', first choose the template you wish to place using the '+' or '-' keys. With the cursor keys scroll to the area you wish to place your template. Remember to keep moving the position of your template so that it is visible on screen using the '<' and '>' keys otherwise you might forget where you put it. Once you are happy with your position press the 'return' key to place your chosen template into the map.

The only other keys needed are the 'runstop/restore' keys which will return you to the title screen.

Happy designing!

Quikword

Simple but user friendly word processor that operates from within a Basic environment

By Mike Holmes

When you look at the large variety of commercial world processor packages that are available, it becomes clear that many of these invariably incorporate an enormous variety of functions in an effort to try to include every possible thing that a user might want to do with them. As a result, such a program appears on the face of it so complicated – whereas in actual fact, it's not – some people just can't get on with it. In reality what tends to happen is that many of these marvellous extra utilities are rarely if ever used.

QUIKWORD is the culmination of an idea I've had for some while, for a word processor that is essentially written in BASIC. As such, it is then easily modified or expanded to include successive extra utilities as and when required (the ones you don't need can be left out), by the simple expedient of writing the extra routines needed in BASIC. As it stands here, QUIKWORD can only enter and edit text, and save or load same to or from a disk. A few block commands are included, but it can't even output to a printer or search for words, etc. The point being that these functions can be added by you, exactly as you want them, in BASIC.

What it has got though, is a three line Command Display Area (CDA) at the top of the screen, printed in yellow, while the remaining 22 lines are for the text, in white. The background and border are brown.

Text is entered by typing anywhere in the text area. QUICKWORD's also got an up/down line by line scrolling screen (tracking cursor), programmable up/down block scrolling, continuous real-time automatic word-wrapping, a flashing cursor and a couple of things you may not have come across before – '*insert mode*' and a '*home stack*'.

In practice of course not everything can be done in BASIC. The simple act of entering a character in the text could take 'years' if it were left to BASIC alone. Inevitably therefore, a large proportion of QUIKWORD, particularly that part directly invovled in text editing and screen display, is machine code as the only way of keeping the speed up. This is important as there is nothing more frustrating than having to wait for a word processor while it's fiddling about. But, this machine code is primarily called from the BASIC program.

Even so, in order to do this effectively, the BASIC is not quite standard. There are a few extra keywords added which help greatly to enable BASIC to interact with the machine code routines more efficiently, and conse-

quently, more quickly. The resultant BASIC program (QUIKWORD) is in the final analysis surprisingly shorter and less complex looking than it might otherwise be, in spite of the fact that some of the functions it's performing are sometimes quite involved.

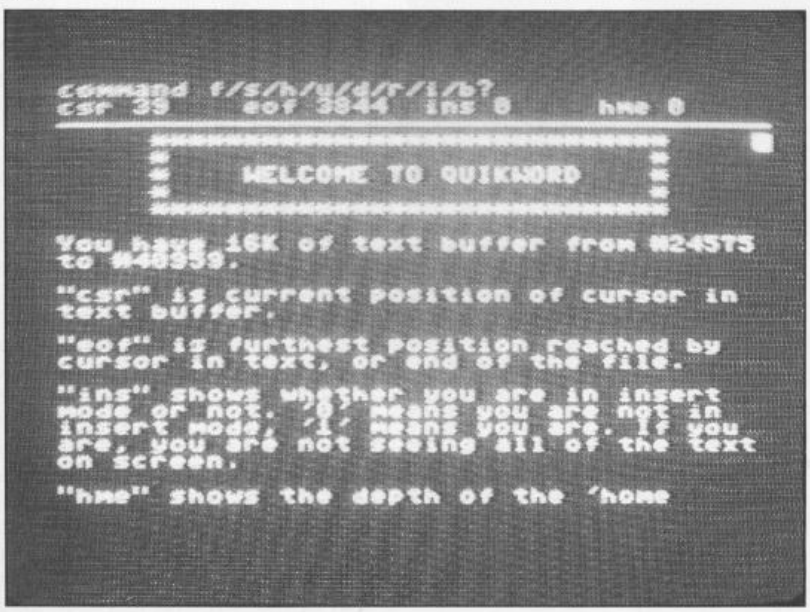
For this reason, the loader program "QW" also copies the BASIC ROM into RAM and modifies it to accept the new extension keywords and routines loaded into the free RAM area at $C000. This must be RUN before QUIKWORD, else the 64 will be totally confused.

The text is not contained in BASIC strings. Instead it resides in a 'text buffer' at 24575 to 40959, the top of BASIC RAM being moved down to 24574. This leaves 22K for BASIC, and in its initial infant form QUIKWORD has just over half filled this up, so there's room left for extensions.

This defines 16K for the text buffer. The text stored here is NOT 'screen mapped', that is to say it's not neatly divided up into 40 byte chunks, each chunk fitting one screen line. Instead the text is continuous from start to finish, having no extra spaces inserted to fill out screen lines to effect word-wrapping. QUIKWORD employs the principle of "hard" and "soft" carriage returns in the text. A "hard" return can be keyed using [SHIFT] [RETURN], normally used for the ends of paragraphs and such. The "hard" returns cannot be altered by the word-wrapping routine. A "soft" return is the normal [RETURN], but it's pointless trying to enter these, because the unstoppable repeating word-wrapping routine is constantly re-organising them all.

It's finding out how many complete words can be fitted on one screen line. It temporarily changes the space between the last word and the next to a "soft" return, then processes the next line, and so on. Obviously ALL "soft" returns have to be replaced with spaces first for the process to work correctly. It does this for the benefit of the text to screen display routine. This routine fetches characters from the text buffer, translates them into screen coded characters (the buffer text is always normal Commodore ASCII), and pokes them into the screen RAM. If it comes across a "hard" or "soft" return, then this is displayed as a space, and the remaining screen line up to the 40th column is filled with blank spaces. This done it then resumes with the next text character on the next line, and so on until the screen is full. Because it isn't synchronised with the video chip or the hardware interrupts, the text has a tendency to "twinkle" slightly, especially on the left hand side, but this doesn't matter very much.

The number of actual characters handled by the text to screen display routine can vary widely because of this.



If the text buffer has been cleared (no text), it's actually stuffed full of "hard" returns. In this event the routine will 'display' just 22 "hard" returns, filling the remainder of the screen with blanks, until the screen RAM is full. On the other hand if the screen is full of text then it has handled several hundred characters.

Because the way in which the text is organised bears no relation to that of the screen, it does cause one or two small problems. For instance, moving the cursor up or down through the text doesn't have the expected results. Moving the cursor down is like a 'line feed', where it will jump to the first character on the next line, regardless of its position on the previous line. Similarly, moving it up causes it to go to the character immediately before the previous carriage return, or as near as makes no odds the END of the next line up. In practice this is often quite useful, as it provides a means of fast access to either end of a line to put the cursor on a word for corrections or insertions.

Important things you should know about the five program files are:

"QW"

QW is the loader program written in BASIC. It first loads "RAM.EXE" then copies BASIC ROM into RAM and alters it to recognise the extensions in RAM.EXE. Never save QW if it's been run, because the mass of funny REM statements at the beginning are used to hold the ROM copying machine code (poked in from DATA lines in a latter part of the program), and so will be corrupted. Always save or copy a fresh un-run version.

"RAM.EXE"

This is the machine code file of BASIC extension routines. Don't meddle with these.

"QUIKWORD"

This is the "host" BASIC program of the word processor. It is automtically loaded and run by QW. When it runs for the first time, it loads "ALL.EXE" and "TOP.EXE". It then alters itself so that it won't load these again if it's

re-run. Line 10 is changed from "10 GOTO 20" to "10 GOTO 60". So if you want to save modified versions of "QUIKWORD", don't forget to alter line 10 to "10 GOTO 20" before saving. QUIKWORD can be safely re-run as it will only 'clear' the text buffer if the EOF count storage is zero. Consequently if QUIKWORD stops for any reason (or if stopped deliberately) it can be re-run without losing any text.

"ALL.EXE"

This is the group of specific text and screen handling routines. When loaded for the first time location 51083 is zero (normally '1' after running). If it's zero then QUIKWORD will load the help text file "INTRO" into the text buffer, as a sort of power up entry message. But it won't if it's re-run and ALL.EXE is not re-loaded. See line 370. ALL.EXE is quite critical in operation, so don't attempt to alter it!

"TOP.EXE"

A tiny bit of machine code used by QUIKWORD's disk directory display modules. The storage of all these routines is spread about in the free RAM area quite a bit, but there are large chunks of nothing between them so there's still plenty of space for your own machine code routines.

"THE SCREEN DISPLAY"

Status information is displayed in the top three lines of the screen, the "CDA" (Command Display Area). The first line may show nothing, or the name of the disk file for the text on the right hand side if this has been defined. This is the normal condition while in text edit mode. The [F1] key is the "Command" key, and is used to put up a simple single line menu of possible commands. This is all done in BASIC so the menus are BASIC strings and can be added to. The menu comprises single characters for the description of a function inter-spaced with slashes ('/'), and ending with a question mark. For example with [F1] key command menu looks like "command f/s/h/u/d/r/i/b?". You key the relevant letter and a BASIC FOR/NEXT loop scans the string for a match; note the command string does not include the word "command". On matching the character an "ON N GOSUB <BASIC line list>" construct is used. The slashes are represented in the list by dummy zeros. If the loop can't match a letter it simply returns to the editor. See QUIKWORD listing for examples.

The first line is also used to enter things like a disk file name etc. In this case it's also a good idea to blank out the second line temporarily, to prevent any text on it being input at the same time, and so that peculiar things don't happen to the CDA display if the rub-out key is used.

The second line shows four things. Because the text is not screen mapped, it's impossible to indicate the cursor position by line and column. Instead, "csr" is a counter showing the cursor position in the text. Similarly, "eof" indicates the furthest point reached by the cursor, and is always used to define the end of the text file in the buffer.

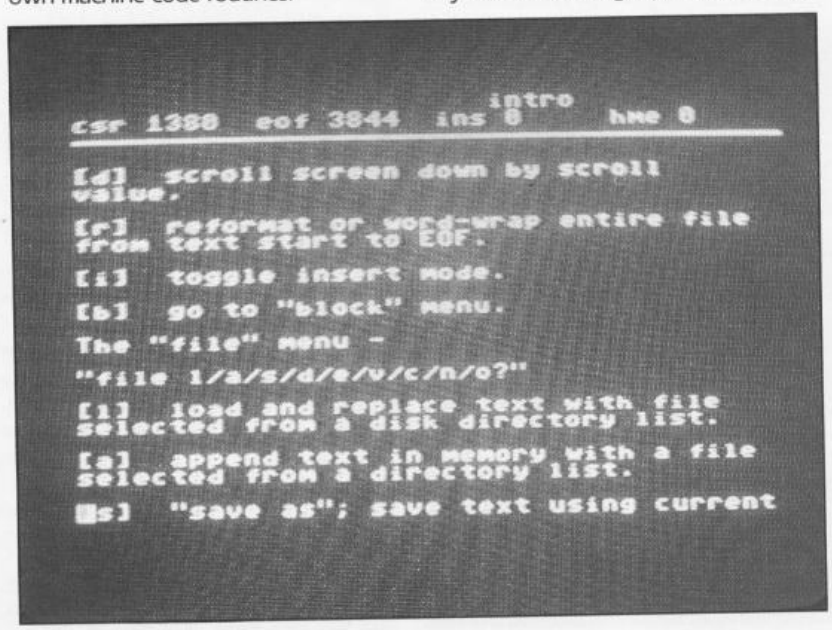
"INSERT MODE"

"ins" shows whether the editor is in 'normal' or 'insert' mode. '0' means normal. Keying '[F1] [i]' will toggle insert mode. All the text from the cursor position onwards will 'disappear', and "ins" will show '1', while "eof" changes to the cursor count, as though this is now the end of the file. In reality the text hasn't disappeared, it's been moved to the extreme other end of the text buffer, where it will stay until the editor is toggled out of insert mode by again '[F1] [i]'. Now you can do one of two things – either type more text at this position, or append a file from disk. Because "eof" registers this position, the editor will temporarily think this is the end of the file for these operations.

On toggling insert mode off ([F1] [i]), the moved text returns, but of course is joined to the end of what's already existing according to "eof". "eof" then reflects the total character count including the new text. Trick, huh?

"THE HOME STACK"

"hme" shoiws the depth of the 'home stack'. What is a 'home stack'? Well, if you key [F1] [h], then the screen's current position in the text will be 'pushed' onto the home stack. If then some while later you key [HOME], then the screen and the cursor will return to this position in the text. The cursor will always be at the top left hand corner of the screen. This is a method for easily and quickly returning to where you left off after doing something else, like looking at some other part of the text. You can have up to ten different text locations for the screen to return to on the home stack.



Each time the stack is 'pulled' by the [HOME] key, the stack decrements to the previously defined position, and so on. The minimum default (zero) is the start of the text buffer ("csr" = 0), can't be altered and is constantly available.

"BLOCK SCREEN SCROLLING"

'[F1] [s]' can be used to redefine the screen scrolling value. Its normal default is 15. If you key [F1] [d] then the screen will scroll down the text by <scroll value> number of text lines. [F1][u] causes it to scroll up the same number of text lines. If at any time the start of the text buffer is reached, it can't scroll up any more. Being able to redefine the scroll value provides what is in many ways a far more preferable and easier to use alternative to the paragraph or page jumping functions of some other word processors. You can give it a small value like 5 or 10 for gentle block scrolling while reading, or a higher value like 20 or 30 for skipping through the text in great lumps to find a place.

The '[r]' option in the command menu causes the entire text file from start to EOF to be reformatted or word-wrapped, and the remaining unused buffer space to be 'cleared' with "hard" returns. This won't affect text at the end of the buffer in insert mode, though.

"DISK ACCESS"

'[F1] [f]' gets the "file" menu. '[l]' is to load a text file, '[a]' is to append a text file to EOF, '[s]' is to save a file.

For 'l'oad and 'a'ppend, you are first presented with a disk directory list on screen. This is inputted from the DOS disk directory, and only SEQ files will be shown, the file type used for text files. It takes the form of the disk name at the top left-hand corner and a separating dashed line in yellow. The list is printed on screen in two columns until the screen is full. Generating this list can be stopped at any moment by keying 's' (for stop), whereupon you will go straight to the selection stage.

If the screen has filled up and the subroutine has gone to the selection stage, and you know full well that there are more files on the disk, then keying 'm' (for more) will get another screen full of filenmaes, as many times as is necessary. However too many times and you end up with an empty screen!

At the selection stage, the first filename in the left-hand list will be in reverse video, this we shall call the "highlight". You scroll the "highlight" around the lists using the cursor move keys. It wraps around left to right and right to left, and also bottom to top, but it won't wrap around from top to bottom. Put it on the filename you want and key return. The file will be inputted into the text buffer, replacing existing text already there if any.

Appending is done in exactly the same way, except that the inputted file is joined to already existing text at the EOF position.

Use '[F1] [f] [s]' to save a file in the buffer. If it doesn't have a name yet then QUIKWORD will wait for you to enter a name for it following the message "save as" in the CDA. If a name already exists, QUIKWORD won't stop, but immediately saves the file. If the file already exists, it is automatically deleted and re-saved, so be careful. The current filename for the text in buffer can be changed at any time by the '[n]' option from the "file" menu. The current filename is also automatically that of a loaded file, naturally.

'[d] is for 'dumping' the current screen (less CDA) to disk as a machine code PRG file. This allows messages to be written which can be loaded into screen RAM by your programs.

'[e]' is for erasing a file from the disk, also using the directory list. You put the "highlight" on the file you want erased, and key [RETURN]. You can only erase SEQ type files as shown in the list.

'[v]' just puts the disk name and directory list on screen to view. Key [RETURN] to exit. Also '[c]' is included in the "file" menu. Choose '[c]' to clear the text buffer and re-run QUIKWORD from start for a new file.

"THE BLOCK COMMANDS"

Editing would be awkward indeed without some form of basic text block manipulation provisions. '[F1] [b]' gets you the "block" menu. '[s]' defines the start of a block in the text at the cursor position, '[e]' defines the end. You don't see anything on the screen when you do this, but QUIKWORD 'remembers' the locations. The nice thing about it is that you can define a block 'backwards', by specifying the end first then backing up the cursor to define the start.

'[c]' copies the defined block to the cursor position. '[m]' moves the defined block to the cursor position. '[d]' deletes the defined block. Unless the option was '[c]', the block pointers are cleared and any repeated attempt to move or delete will result in a "can't, no block" error message in the CDA. If the block was copied though, the pointers remain intact so that it can be copied again, but be careful, repeated copying is only possible down through the text beyond the source block. Copying backwards causes the copy to be inserted BEFORE the source block, which is OK the first time, but afterward the block pointers, although unchanged, are not enclosing the same bit of text anymore!

Option '[f]' of the "block" menu saves the defined block to disk as a text file. The function always asks for a special name for the block, and preserves the proper file name for the text.

As you can see, extra characters to match can be added to the menu for further functions. For instance 'p' could be added to the "command" menu, and the 'ON' statement following have added to it the line number of a printer control subroutine. QUIKWORD follows a structured programming convention where everything is written in subroutines, and I recommend you keep it that way. In the example of a printer driver you can then start defining special printer control codes which can entered in the text preceded by a control character like "*" for example. In any event it's worth mentioning that this entire article was written with QUIKWORD.

The new BASIC keywords will only be recognised by the 64 if "QW" has been run. To re-instate the RAM version of the interpreter, should say [RUN/STOP] [RESTORE] be keyed, POKE 1,54 then the C64 will recognise the strange tokens. To enable it to LIST them as well, POKE 774,150: POKE 775,192. The extra keywords are –

"SUBEX"

Simulate a RETURN from subroutine, without actually returning, allows a GOTO or RETURN from the calling

routine, in the case of an error for example. Must be on a line on its own or a "SYNTAX ERROR" occurs.

DOKE <address>, <value>

Poke <address> and <address>+1 with double byte integer <value> in low-byte high-byte format. <value> must be a positive number between 0 and 65535.

PLOT <y>, <x>

Calls the Kernal PLOT routine. Locates cursor on screen at row <y>, column <x>. Normal system cursor only, not the editor's cursor!

MOVE <dest.>, <source>, <length>

Move, or in reality copy, memory to starting address <dest.>, from <source> for number of bytes <length>. Also copes with overlapping areas when moving both up or down so data is not corrupted.

FILL <address>, <length>, <value>

Fill memory from <address> for number of bytes <length> with <value>, which must be 0-255.

<value> = DEEK (<address>)

Return two byte integar contained in <address> and <address>+1 in low-byte high-byte format to <value>, normally a variable.

LINE . INPOUT <string variable> and
LINE . INPUT# <channel number>, <string variable>

Input a string only of all printable characters from keyboard or external device with no regard for special delimiters.

THE TEST EDITOR ROUTINES

Here is, as briefly as possible, a description of the specific text and screen handling routines.

MEM2SCN $C670 #50800

(Memory to screen). Display text on screen commencing with text address pointed to by zero page pointer 251-252. Convert CBM ASCII characters to screen values and put in screen RAM. If "hard" or "soft" returns found then fill remainder of screen line with spaces, and continue. If the contents of the text scanning pointer equal the contents of the cursor pointer, then display character in reverse video, but only if COMMAND wants the cursor to be 'ON'. Finish when screen is full.

FORMAT $C72A #50986

Format or word-wrap an area of text by re-organising "soft" returns, commencing with address pointed to by 53-54, finishing at address pointed to by 251-252.

UPDATE $C773 #51059

Update screen text display by preparing pointer $FB-FC with contents of TCONST, then call MEM2SCN.

TCONST $C781 #51073

Text CONSTant (2 bytes). Contains current text start address for screen. Is pointed to by BASIC variable 'SPTR'.

EOF $C783 #51075

"eof" counter (2 bytes). Is not an address, but an offset from text start. Is pointed to by BASIC variable 'EOF'.

INS $C785 **#51077**

"ins" mode flag (2 bytes). Normally contains '0' or '1', but can be other values for other functions. Is pointed to by BASIC variable 'INS'.

HME $C787 #51079

"hme" counter (2 bytes). Can be 0 to 10. Is pointed to by BASIC variable 'HME'.

CCNT $C789 #51081

"csr" counter (2 bytes). This is not an address but an offset from text start. Is pointed to by BASIC variable 'CSR'.

CTDN $C78B #51083

All purpose mode flag (1 byte). Is used for example by QUIKWORD to indicate whether or not to load "INTRO" into text buffer. Normally 1.

COMMAND $C78C #51084

This is the main editor control routine. It is called by BASIC "QUIKWORD" with 'C = USR(X)'.

Gets a character from keyboard buffer and tries to interpret it. If it is a cursor move character, then perform necessary operation. If it is "[F1]", "[HOME]", "[DEL]", "[INST]" then return to BASIC, putting the ASCII value in the varialbe 'C', so BASIC can carry out these operations. If it is equal to USR1 or USR2, then proceed as required. If none of these, assume it is a valid character to be put in text buffer at cursor position, and increment cursor. Then update screen with FORMAT and do scroll checks. Return immediately to see if there's more characters in the keyboard buffer.

If there are no characters in the buffer then do all of the routines below, but excluding ADDC, SUBC and TLDSAV.

USR1 $C7A4 #51108
USR 2 $V7A8 #51112

User definable characters to match. Poke an ASCII value here for COMMAND to 'trap'. If they match, then jump to P5 or P6 respectively.

P5 $C7E2
P6 $C7E8

P5 and P6 normally jump to exit to BASIC if USR1/2 are found. The character will be returned in the variable 'C'. Alternatively, either P5 or P6, and the two-byte address following each, can be changed to JSR or JMP <address> to your own machine code routine. In this case, the character will be in the accumulator.

FLASH

Flash cursor using jiffy clock as a timer. If cursor is supposed to be 'ON', then ensure first instruction of the subroutine CHKCSR (a part of MEM2SCN) is the right one for normal operation. If cursor is supposed to be 'OFF', then change the instruction to RTS to disable CHKCSR. Can't be called independently of COMMAND.

DISPLY $C835 #51253

Update CDA values. Calculate cursor count from cursor pointer and print. Check if cursor count > EOF, if so make EOF = CCNT, and print EOF. Print INS and HME.

LIMITE $C8AC #51372

Ensure cursor is within text buffer area. Pull it back in if not.

ADDC $C8D0 #51408

Advance cursor one text line.

SUBC $C8ED #51437

Retreat cursor one text line.

COMP16 $C911

Compare two 16-bit numbers. Calling protocol: push stack, lo byte NUM1. Push stack, hi byte NUM1. LDX, lo byte NUM2. LDY, hi byte NUM2. JSR COMP16. NUM2 is subtracted from NUM1. If on return the carry flag is set, then NUM1 is greater than or equal to NUM2. If the carry is cleared, then NUM1 is less than NUM2. The result of the subtraction is stored at $C944. Can't be called in BASIC, obviously.

SCLCHK $C948 #51528

Call UPDATE then see if cursor is within text area just processed by MEM2SCN. If not then scroll screen up or down to keep track.

TLDSAV $C9B6 #51638

If CTDN = 0 then load or input text file from external device, commencing at address pointed to by 253-254. In the process, change ordinary returns to "hard" returns. Is called in BASIC by "SYS 51638, <channel number>". The comma and <channel number> must be present or a "SYNTAX ERROR" results. The channel has to be OPENed first in the normal way, and CTDN POKEd with zero.

If CTDN = 1 then save or output text in buffer to external device, commencing with address pointed to by 253-254, and finishing at address pointed to by 251-252. In the process, change "soft" returns to spaces, and "hard" returns to ordinary returns. Called exactly as a load but CTDN is poked with '1'.

And the cursor? Well this is the zero page pointer $FD-FC 253-254. That's all. Just an address.

It might be gathered from all this that if you want to extend QUIKWORD, you must get used to the idea of referring to things using pointers. For this purpose DEEK and DOKE were developed, to get around the laborious and erronous business of calculated addresses from PEEKs and POKEs alone.

COMMONLY USED BASIC VARIABLES

TS text start pointer, 24575
TE text end pointer, 40959
IS pointer to location of moved text while in insert mode. Also used as top of temporary storage indicator for blocks being moved or copied. Normally = TE
IL inserted text length
BS block start pointer
BE block end pointer. If undefined both these = TS
H(0-10) the home stack
SS screen scroll value
L initially machine code loading counter, thereafter commonly used for length value for MOVE and FILL
N all purpose FOR/NEXT loop counter, and temporary storage for numeric values
NL length of memory moved while inserting/deleting single characters
C$ general purpose character GET. Also used for temporary strings
C the ASCII value of C$
IN$ general purpose input string
FILE$ name of text file in buffer
SPTR pointer to TCONST
EOF pointer to EOF
INS pointer to INS
HME pointer to HME
CSR pointer to CCNT
C0$** to **C8$ constant CDA strings
CX$ temporary working CDA string
ERR$ disk drive error message

ZERO PAGE POINTERS USED
Utility text scanning pointer

253-254 $FD-FE

Constant cursor location pointer

53-54 $35-34

Text scanning pointer used by FORMAT

113-114 $71-72

Temporary screen scanning pointer used by MEM2SCN. Can't be POKEd in BASIC as BASIC uses it as well.

STOP PRESS: STOP PRESS

Modifications and Additions "file" load/append/view/erase –
1. The 'highlight' of the file selection directory list on screen no longer leaps to the right hand column if this is where it was last time it was used, as soon as the cursor move keys are pressed.
2. A load/append/erase operation can be escaped from at the selection stage by keying 'x'.
3. Extra option 'o' added to "file" menu. '[F1] f o' switches disk operations to 'other' drive. If was device 8 then now device 9, and vice-versa.
4. When changing name of current file in memory ('[F1] f n'), filename is also printed prior to input for editing, obviating the need to re-key the whole thing again if just a small change or edit is needed.
5. Appending a file from disk no longer obliterates the current filename.

"text" menu functions –
1. If going to end of text in buffer (EOF; '[F3] e') but total amount of text is less than one screen full, then no more does rubbish appear at top to fill it out to bottom of screen (was actually bit of top of BASIC memory below buffer!).
2. Slightly improved "find" function now makes distinction between upper and lower case letters and searches on text with combinations of caps and lower case. Also if and when found (still a bit slow I'm afraid) screen goes straight to location in buffer instead of laboriously scrolling down to it. Can still be escaped from with 'x'.
3. Extra option '1' added to "text" menu '[F3] 1' deletes line from cursor to end including 'hard' or 'soft' return.

New error bleep

If a key pressed does not match a menu selection list then a bleep is sounded

New electronic Caps Lock mode

An additional machine code routine wedged into 'COMMAND'. Invoked by key [F7], it converts all alpha characters into upper case, but ONLY alpha. SHIFT key unecessary. All other characters on keyboard can be accessed as normal with or without SHIFT. SHIFT + alpha = no change (still caps). 'CAPLOK' routine switched off with again [F7].

New faster goto next/previous word.

CTRL N – go to beginning of next word. CTRL P – go to end of previous word. Works even if a 'hard' or 'soft' return between words.

Multitasking concepts for C128

We begin a series of articles for implementing a multitasking system on the C128

By D. Kelsey

Multitasking

Multitasking was a term that was associated with mainframes and minicomputers, but has only recently been associated with micro computers, with machines such as the Amiga providing this feature. So what is multitasking?

Multitasking is the term used to describe a computer which 'appears' to be doing several things at once. You will have experienced a form of multitasking on your commodore already. I'm sure that in some time or another, you have played an arcade game on your commodore. There you have objects moving on the screen and music playing in the background. Well the computer is appearing to be doing several things at once. Therefore by the above definition this is multitasking.

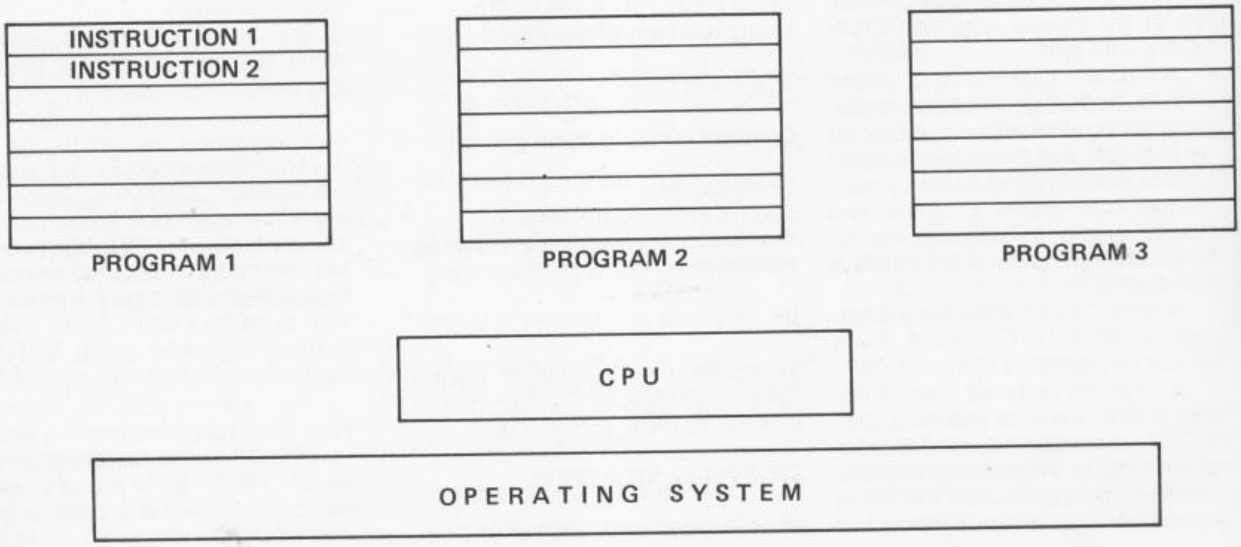
About this article

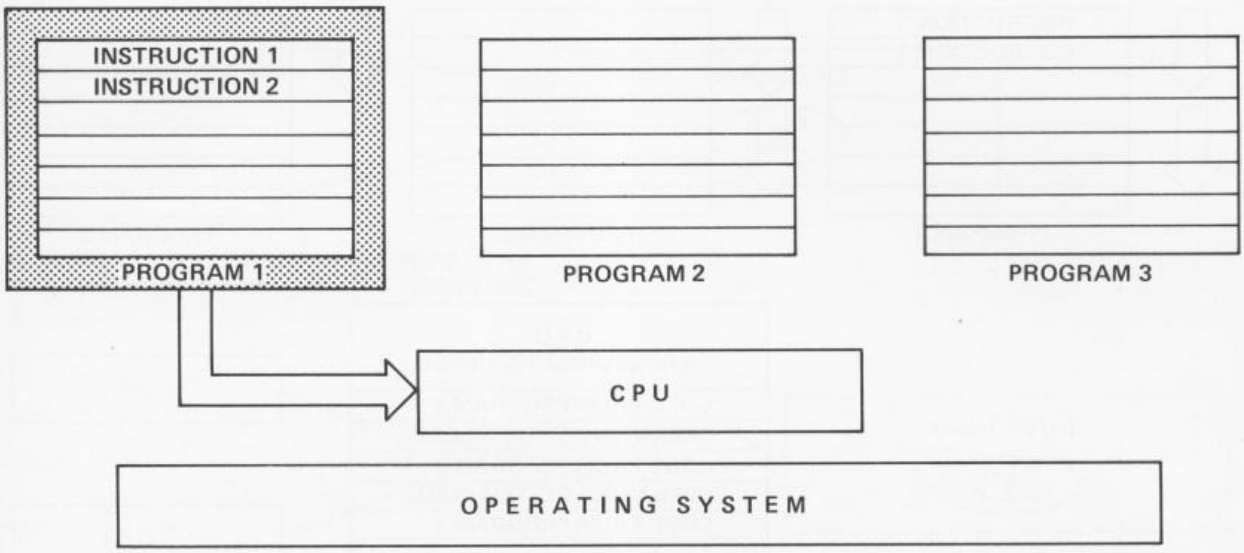
The purpose of this article is to introduce multitasking in a general sense and to take the reader through the development of a very simple operating system that provides multitasking on the commodore 128. It will also introduce techniques for designing programs to run in a multitasking environment and to be able to design extensions to the opeating system thus making it more powerful.

This article is meant for people with an understanding of machine code and some understanding of how the commodore 128 works although I will endevour to explain the concepts to the best of my ability.

Multitasking Operating Systems

A multitasking operating system allows a user to load and run many different programs into the same machine and have them all running at the same time. But how is this possible on a commodore 128. There is only one processor (ignoring the Z80 as this cannot be used as the same time as the 8502 and this system is designed purely for





the 8502.) so only one instruction from any one program can be executed.

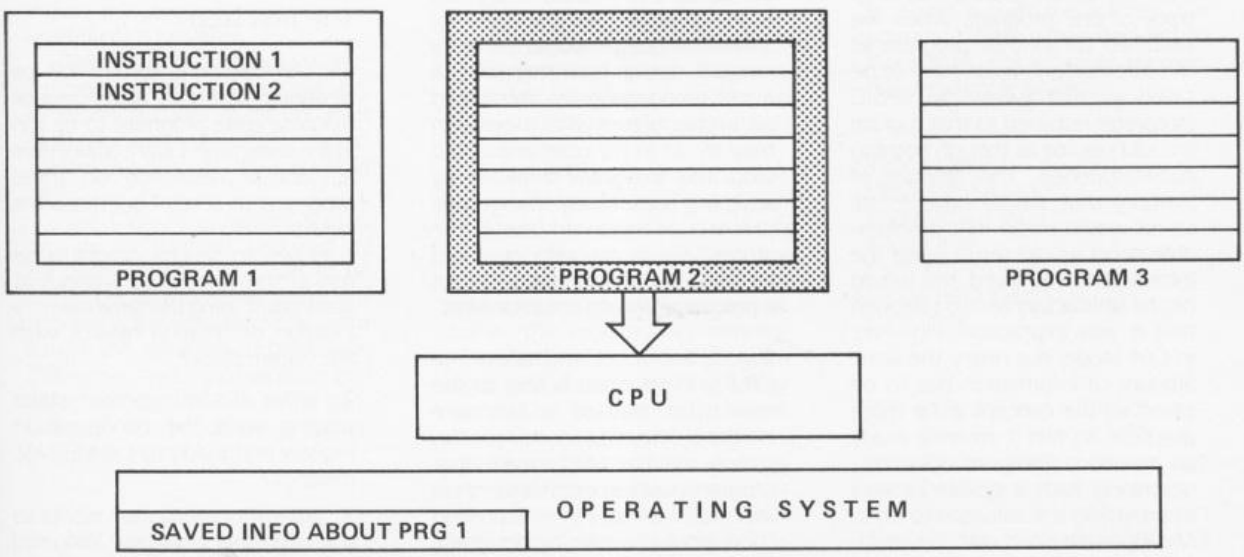
The answer lies in a clever bit of software which 'switches' which program is being run on the microprocessor.

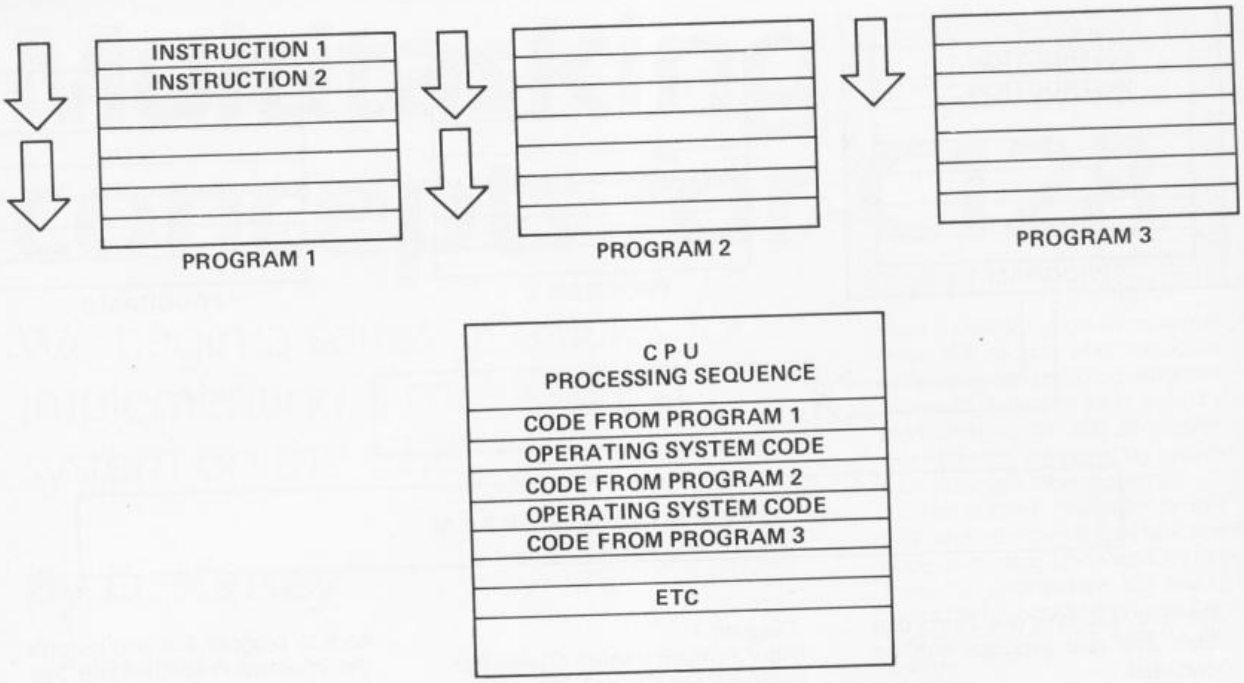
Diagram 1
In the diagram above we have several programs and one CPU. What we want is for all these programs to appear to be being processed by the CPU. What the operating system does is say:- let the CPU see program 1 and start executing it.

Diagram 2
After a certain amount of time, The operating system gets control and says:-
right that is enough of that program, saves all relevent information about where the CPU got to while running that program, and move onto program 2. ie let the CPU now see program 2 and start executing it.

Diagram 3
This is repeated for all the programs it can see. When it has gone through all the programs once, the operating system points the CPU back to program 1. It also restores the information saved about that program and allows the CPU to continue executing program 1. As the CPU starts back on program 1 where it left off it just appears as though nothing has happened except a slight delay. Therefore the sequence in time for the programs and the CPU are shown below.

Diagram 4
A certain amount of time is allocated for each program. When that time limit has expired, then the operating system stops the CPU executing one program and points





the CPU to another program to run.

Implementing this on C128

The first question is how can this be done on a C128? My first thought was if it was possible to have BASIC programs appear to run simultaneously?

I decided that it was possible but because BASIC on C128 uses a lot of memory locations to keep track of one program, when we switched to another program all this information would have to be saved so that when the BASIC intepreter returned to that rogram it could resume as though nothing had happened. The amount of memory that would have to be saved would mean that a noticeable delay would result while the information was saved. this would not be satisfactory and so I decided that it was impractical. However in C64 mode, not nearly the same amount of information has to be saved so the concept is far more practical. In fact I recently ready an article in "Compute's Gazette" describing such a system as well as providing the software to do it. My approach deals with the multi-tasking of machine code programs.

Before even starting I had to decide on a method which determined when to stop running one program and start another. 2 options were available:-

1. By interpreting every instruction of the program This method means that after a certain number of instructions The operating system could save the information and start intepreting another program in memory. The good bit about this would be that I could design my own language, but the code for a new language would be quite long. I could just interpret a machine code program. This would allow control over what the person tried to do in his code and could stop the program from doing anything potentially dangerous (this will be explained later in the article.). Also a tracing facility could be built in and information about a program running could be kept.

2. Use interrupts and allow the CPU to have direct access to the code. This method is far more efficient allowing code to run directly on the CPU means that programs will run much faster than method 1. Also no interpreting code would have to be designed. The only problem is that, because a machine-code program could do anything, a potential time-bomb could be written which could cause the operating system to crash. Again the reason for this will be explained later along with a solution.

The decision was made to go for method 2, providing the most efficient system and provide guidelines to stop programs from being written that could cause problems.

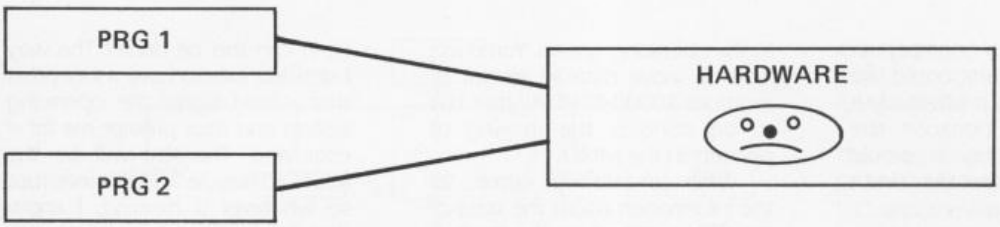
The first step

Ok, An operating system will be designed that can allow several machine code programs to be run at the same time. I want a minimum amount of restriction on these programs so several questions are raised:

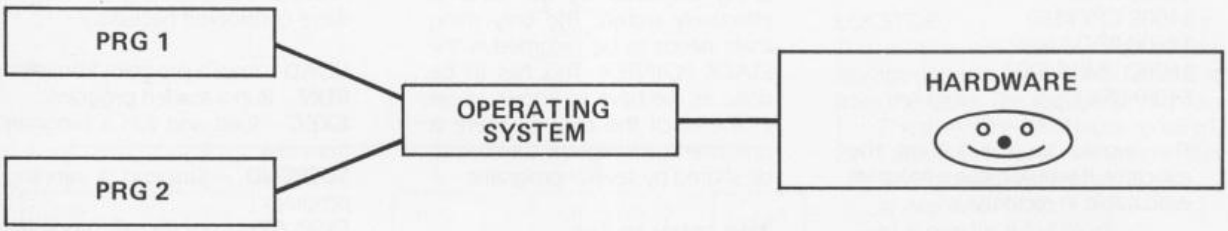
1. How can several programs be run at the same time without at some point using the same memory location or creating havock with the system stack?

2. What if the program starts playing with the configuration register and trying to call KERNAL routines?

3. What if one program wants to use interrupts which are also used



HARDWARE GETS CONFUSED. WHO IS HE TALKING TO? PRGS ALSO GET CONFUSED



HARDWARE TALKS TO OPERATING SYSTEM

by the operating system?

Part of the answer to question 1 was to have for each program, it's own copy of page 0 and page 1. As these pages are special these were the only ones considered to have individual copies for each program. To stop programs from using other locations a guideline should be enforced to say that within your machine code program all memory locations used should be contained within the start and the end of a program.

Only the memory locations within the program block can be used by that program.

There may be instances where a program will have to use memory locations outside of its program block (for example writing to the screen) but this will all be covered later.

The Operating system should provide all routines required to control Hardware. This has to be done because several programs running at the same time may want to use the same bit of hardware. Obviously this cannot be done and some sort control has to be provided to share out the resource properly.

As the kernal routines for the original operating system weren't designed for a multitasking environment, they should never be accessed.

memory is also hardware and so will be controlled by the operating system. Thus there will never be a need to use the configuration registers ($ff00-$ff03) and so should never be used.

Question 3 is difficult, and the easy solution is just to say interrupts can never be used. See the section on expansion later in this article for further ideas.

Memory

Right, this is the first consideration of the operating system and some fundemental ideas have to be explained before any progression can be made.

Imagine several programs have been written. They have been designed at specific areas in memory (not necessarily for any reason) and we want all these programs to run at the same time within the multitasking environment. The problem is that program areas will overlap and so if they were just loaded in at *their* designed locations, programs would lose part of their code as one program overwrote another either when it was loaded or while another program was running. This situation could cause the whole operating system to crash and obviously needs to be resolved.

The solution is to 1st keep track of what memory is available and what memory has been used. This means that all used memory locations apart from page zero and page one must be contained in the program block so that all memory used can be known to the operating system. The second part of the solution is to provide a program relocator that takes a program in memory an changes the addresses used so thta it can be used properly ie it can run at the address the operating system has decided to place it at. For example consider this very simple program.

```
$3000 LDY # 0
$3002 LDA $3200,Y
$3005 STA $3400,Y
$3008 INY
$3009 CPY # $50
$300B BEQ $3010
$3010 BRK
```

(The program start = $3000
end = $34FF
this includes all the code and data used by the program)

Now suppose memory wasn't available at location $3000 but

there was enough memory at $4000 this program could be loaded at $4000, but obviously it couldn't be run because the addresses are wrong. It would work if the addresses were changed as follows:-

```
$4000 LDY #0
$4002 LDA $4200,Y
$4005 STA $4400,Y
$4008 INYU
$4009 CPY #$50
$400B BEQ $4010
$400D JMP $4002
$4010 BRK
```

This would be the job of the relocater. It would make a program executable in memory.

Talking with the operating system

The user will have to be able to talk to the operating system in order to load in programs and run them. This means that some user interface is required. So a facility has to be provided to accept and process commands.

Swopping programs

This is the most important part of the whole system. When a program reaches the end of it's time slot and the next program is to continue it's execution, what information has to be saved?

The obvious ones are the 8502 registers. These are A,X,Y the stack pointer and the status register. I also mentioned that each program has his own page 0 and page 1, so these might have to be saved. In the real case however this doesn't have to be done. One of the features on the MMU is that the you can specify where in memory page 0 and page 1 are (refer to the MMU article for further information on how this works). All htat has to be done is say that for any particular program 2 pages are reserved for page 0 and page 1 and all that is required is that the MMU points to them and that the memory is flagged as used by the operating system. Therefore each program can have it's own page 0 and page 1 as well as the operating system. You don't have to move data in an out of locations $0000-$01ff. All htat has to be done is the moving of pointers in the MMU.

When an interrupt occurs, all the information about the state of the CPU is stored on the stack. If the stack is moved to point to a new stack, all the information about the program which was being executed by the CPU is effectively stored. The only thing thats needs to be recorded is the STACK POINTER. This has to be done as we have to know where in the stack the data is. There is only one stack register that has to be shared by several programs.

The sotry so far

The operating system that will be designed will use interrupts to swop programs. The interrupts to be used will be IRQ interrupts. This allows for some interesting programming techniques which will be explained later.

Further Considerations

What happens if a BRK command is encountered when a program is executing. This has to be dealt with and the simple solution is just to remove the program from memroy. (similar to QUIESCING it see later).

Storage will have to be monitored. The operating system will need to know what memory is available and what memory has been used.

A program table is also needed. The operating system needs to know some information about a program so that it can switch to different programs. Information such as progrm name, where the program's page 0 and page 1 can be found and where the program is actually located in memory.

Some method of program relocation will be required as explained in the last part of this article. This would be required once the program has been loaded in memory.

Some sort of interface is required for the user to communicate with the operating system. How can this be done? The way I decided was to have a key-press that would signal the operating system and thus prompt me for a command. The key will be the RESTORE key. ie an NMI interrupt so whatever is running, I know that I can still get to issue commands to the operating system.

Commands to the operating system such as *LOAD* will be needed. The following commands were considered necessary:-

LOAD – load a program from disk
RUN – Run a loaded program
EXEC – load and run a program from disk
SUSPEND – Suspend a running program
DISPLAY – display all programs currently load and there status ie running or suspended.
QUIESCE – display all programs currently load and there status ie running or suspended.

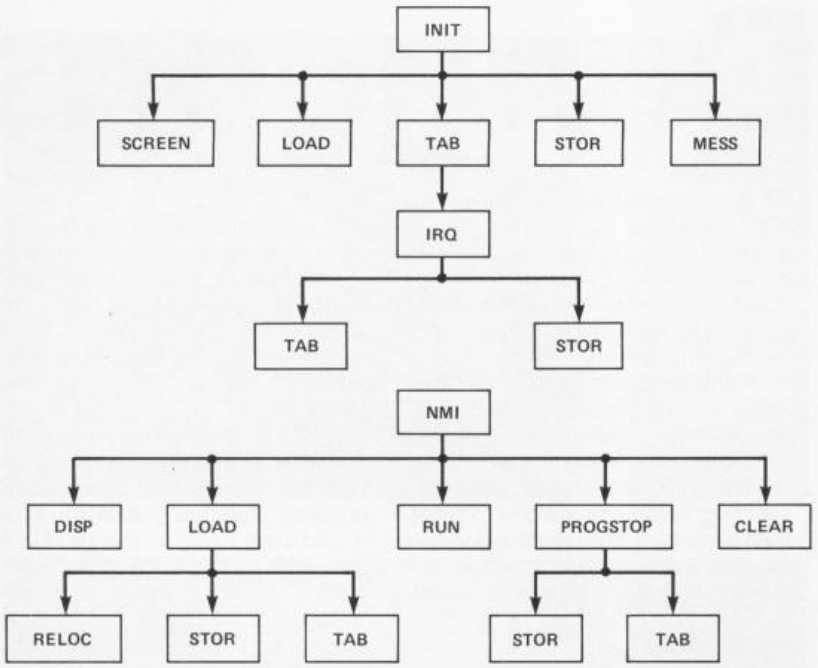
The suspend state is when a program is actually in memory, but the CPU never actually processes any of the logic.

From this I have now described the basic elements of a simple multitasking operating system. There are of course other components which are not as critical to the system but are necessary and provide useful function. From here I will describe the components of the system, providing the assembler code which is commented. Included also will be further descriptions and diagrams of the design and problems overcome in the design.

The code was written using the Lazy Greenius Assembler package available from ICPUG public domain software.

The modules making up the package are as follows:-

EQUATE – general labels and page zero equate map
INIT – initialise the MultiTasking operating system
COMMON – Common useful routines
TAB – maintain the program table
STOR – maintain the storage table
IRQ – control IRQ interrupts (program swoppong)



THE ABOVE ROUTINES ALSO USE 'MESS', 'SCREEN' AND 'COMMON' AS WELL

NMI – process NMI interrupts (command entry)
LOAD – load a program into memory
DISP – process the display commnd
RUN – process the RUN command
RELOC – relocate a program in memory
PROGSTOP – process SUSPEND and QUIESCE commands
MESS – Output messages to the screen
SCREEN – Screen control for the operating system
CLEAR – Clear the screen

The calling structure of these modules being as follows:-
The top box being the main routine. Any box stemming off from another means that it calls that routine.

Storage Table Routines

The operating system has to know what memory is available for use and what memory has been used. This means some sort of table needs to be maintained with routines that can be alled to perform functions on this table. The functions that are needed are:
1. Locate a free block of storage based on a certain size and remove it from the table (thus indicating that memory isn't free)
2. Given an address of a memory block and it's length, add it to the table so as to indicate that this bit of memory can be reused (free storage).

Storage flag!	ram block!	start!	end!
1 byte	1 byte	2 bytes	2 bytes

The storage flag indicates whether the table entry is used or not. 1 = used. 0 = table entry free. The other areas define the available RAM.

RMA block takes on 2 values. 0 – RAM block 0 (equivalent to RAM configuration 3E). 1 – RAM value 1 (equivalent to RAM configuration 7E).

The table is of fixed size with fixed table entries. We need the flag to indicate whether a table entry is used or not.

There are 3 components to the storage module.
SETSTOR – initialise the storage table
LOCSTOR – locate a certain amount of storage and remove from the table
FRESTOR – Free up a block of storage. ie add to the table

SETSTOR
This routine will set up the storage table with the following information.

RAM 0 $3000 – $CFFF free
RAM 1 $1000 – $CFFF free
RAM 1 $E000 – $FEFF free

The area from $D000-$DFFF in both RAM 0 and RAM 1 is reserved for the I/O and the area from $1000 – $2FFF in RAM 0 is used for the MT operating system. The area $E000 – $EFFF in RAM 0 is used for the loader and will be explained later.

LOCSTOR
This routine will find an area of free storage via the table, and remove it from the table. The required input is:-
1. The size of the RAM block required.
2. Option selection on where this RAM should come from
a) Any RAM block
b) A specific RAM block
c) wether the storage must start on a page boundary (page 0 and page 1 location)

FRESTOR
This routine does the opposite of the above. It will add storage to the table to indicate that it can once more be used. If the table is full, a clean up process is initiated to try to free up areas in the table. If it cannot, then an error message is produced.

input
ram block of the storage
Start address of the storage
end address of the storage

output
flag to say whether operating was successful.

An extra piece of code within the free storage routine tries to clear up the table if it cannot find a free entry in the table. It scans the table from top to bottom concatenating table entries where possible. It places concatenated information at the bottom end of the talbe rather than the top so as to allow further checking on this new information as it goes down the table.

To be continued next month...

Disk Dungeons

End of an era?

Level 9 have just released their last ever adventure, *Scapeghost* (see review elsewhere in this article.) In future, they will be concentrating on a new game system called *H.U.G.E* with the aim of producing games similar in style to *Defender of the Crown,* ie a mix of strategy and arcade sequences.

Some games are being produced under license to other companies and about which Level 9 are remaining, understandably, tight-lipped but they also plan to release a couple of titles under their own name. The bad news for readers of this magazine though is that these new games will only be for sixteen bit machines.

I have been playing Level 9 adventures ever since they first came out. My own personal favourite was *Dungeon Adventure,* the third game that they ever released. Even if I have not enjoyed some of their recent releases quite as much, (with the notable exception of Scapeghost), I would like to offer a personal thank you for the many enjoyable hours spent puzzling over their games.

Role Playing Bonanza

A whole host of role playing games are going to hit the shelves fairly soon. Again though, the bad news is that most are being written for the sixteen bit machines, whether any will end up being converted for the C64 remains to be seen.

Two that will definitely appear though are from **Electronic Arts. *Sentinel Worlds*** is a futuristic game in which your three planets are under attack from unknown raiders. Your five characters will have to use their entire range of skills if they are to sort things out. The programmers claim that all the non player characters within the game all have their own personalities and that conversation with them forms a crucial part of the game.

Dragon Wars is the latest game from the authors of *Bard's Tale* and indeed, characters from that game can be transferred over. The once good King Drake has suddenly banned all magic and has started conquering all the islands in Oceana. All sorts of guardian dragons have been released and it is into this turmoil that your party has been thrown.

The game features pop up windows and automapping routines. In addition, you can choose what degree of combat resolution you want as well as decising on the strength of your spells and selecting tactics for ranged combat. Both games will cost £14.99 and should be released at about the time this magazine appears on the news-stands.

Hints available

Should you be stuck in one of **S.S.I's** Dungeons and Dragons role playing games, then help is at hand in the form of clue books (price unknown) available from **US Gold.** At the time of writing, I have seen the books for *Pool of Radiance* and *Hillsfar* and very good they are too.

All the maps are drawn for you together with notes on all the significant areas of the game. In the Hillsfar book, therer are also tips on how to succeed in the arcade sequences and four short stories about characters within the game.

As far as Pool goes, the book helps considerably but does not spoil the game in any way. You still have to fight your own battles and find your own treasure and information. Anyone who has been following my solution to Pool in recent issues will be interested to know that I only cribbed from it in areas of the game that I hadn't actually experienced. As everybody will play the game a different way, so they all have their own tales to tell.

Hints for writers

If you enjoy writing your own adventures, perhaps using one of the several utilities available such as *Graphic Adventure Creator* or *Professional Adventure Writer,* then there is a new fanzine that you might be interested in.

Called *Adventure Coder,* it contains several articles on how different contributors have gone about solving particular problems using GAC, PAW and machine code as well as letters, humorous articles and useful addresses (they have even got me in it so it must be good!).

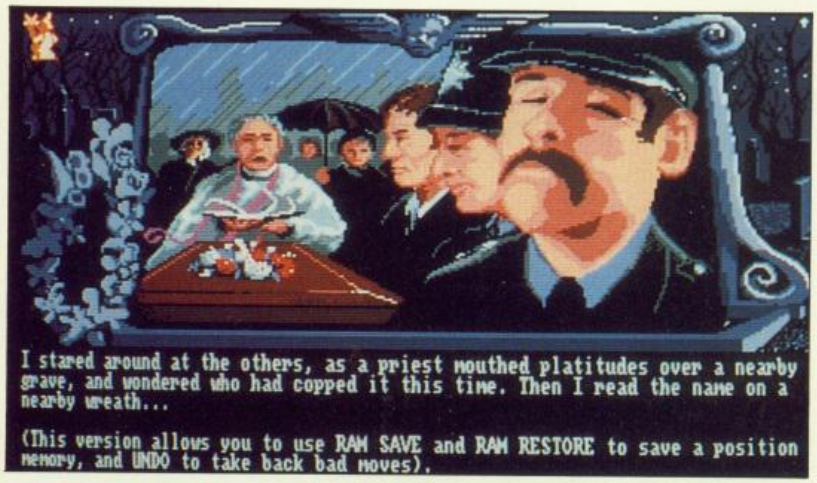
At the time of writing, the magazine is still in its infancy and would love contributions from the amateur author. Anybody interested in obtaining a copy should send £1 for one issue (£12 for one year's subscription) to Christopher Hester, 3 WestLane, Baildon near Shipley, West Yorkshire, BD17 5HD.

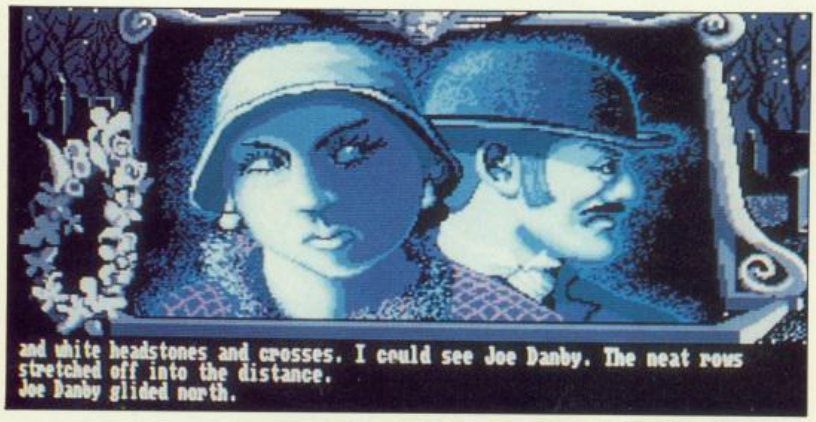
SCAPEGHOST

Apart from the obvious bewilderment at waking up at your own funeral, it is your professional pride that is hurt the most. Apart from paying token respects to your body, your police colleagues are blaming you for the undercover mission that went wrong.

Eavesdropping a bit more, you discover that the drug gang that you were investigating were interrupted before they had a chance to kill your assistant Sarah. She was however taken hostage. Now you know that the only reason that the mission failed was because the gang received a tip off. In no way were you responsible but how can you prove your innocence? The operation was due to finish in three days so presumably yu only have that amount of time to discover the truty. There are through some more pressing problems such as how do you come to terms with being a ghost?

At first, these problems seem insurmountable. You struggle to pick up some thistle down and even that proves too much to handle should you try to life up a leaf as well! Slovely, you realise that while yo do not possess any great strength, there might be other powers that you can exploit instead. Psychic powers, levitating objects, walking through walls and all the other thngs that ghosts are supposed to be able to do.





As night falls, so you meet some of the other inhabitants of the graveyard. The local publican – or what is left of him – befriends you and yes, therre is the old joke about not serving spirits. He shows you round the place and introduces you to the residents. They would love to help you but they all have problems of their own. Perhaps if you could help them, they would return the compliment. The colonel is worried about the lager louts that vandalise the churchyard. A married couple are bickering about a wreath. You know where the other other one is but how can you move it?

You must accomplish your tasks before the sun rises. In the first part of this three part game, you need to delay the crooks. You soon discover where the drugs are stashed but how to hide them. The probglem is that the areas around the church are lit by a large spotlight and you can't find the switch. Exposure to this strong light rapidly weakens you and your allies.

In the second part of the game, you have to discover assorted clues and make sure that the emergency services discover something so obvious that even they realise that something is afoot. In the final part, you must distract the lookout so that he doesn't alert his mates when the police arrive and then rescue your partner whilst also ensuring that vial evidence does not get destroyed.

The Level 9 parser is well up to its usual standard and I had no problems at all in finding the right word or phrase to use. Interaction with the other characters works well and there is the usual range of jokes to amuse you. Possibly tricky situations can be saved to RAM. You can also switch on the 'exits' command to assist your mapping. By far the most useful commands, though, are the high level ones that allow you to go to a place, person or object and follow someone.

These are mere technicalities though. What really grabs you is the wonderfully inventive storyline coupled with the interplay between the detective skills and the ghostly skills. This is Level 9's best game for some time and I recommend it strongly.

Title: Scapeghost
Supplier: Level 9, P.O. Box 39, Weston-super-Mare BS24 9UR

REVIEW OF THE YEAR

As Christmas approaches, so it is the traditional time of year when reviewers like to indulge themselves and produce a list of the game they most enjoyed over the previous twelve months. As no sizeable bribes were forthcoming, the list is a pretty fair assessment of what has entertained me the most.

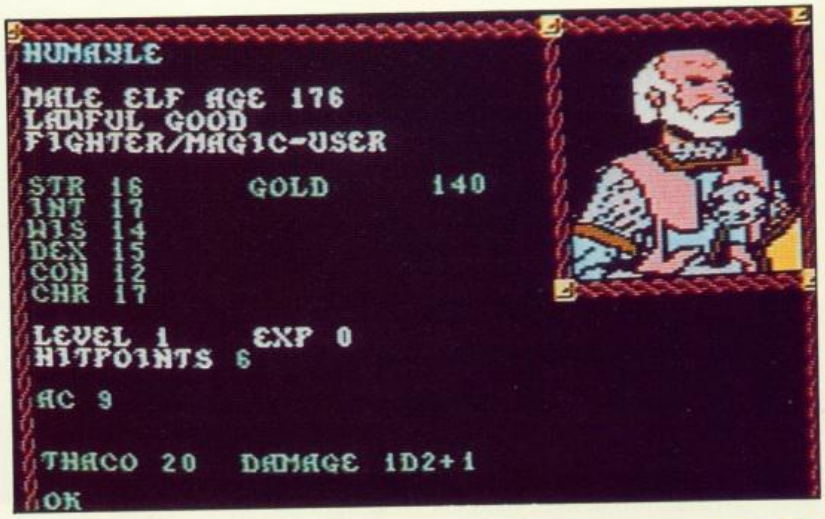
First to arrive was the long awaited official *Dungeons and Dragons* game from **S.S.I/US Gold,** *POOL OF RADIANCE* and a pretty good effort it was too even if it did had a naff ending. The game followed the rule books exactly and it made a very pleasant change to have all the number crunching done for you instead of having to hunt through dozens of badly arranged manuals trying to find the exact table you wanted whilst simultaneously making sure that the other players did not accidentally restore all their hit points when you weren't looking.

From **Origin** came *ULTIMA V,* the latest, if not unimaginatively named, magnus opus from the pen of Lord British a.k.a. **Richard Garriott**. The game featured twice as much detail as before and is to date, the only game I know where you have to play a harpsichord. Unfortunately, time did not permit me to do more than scratch the surface when I reviewed so at the moment, the box is sitting gathering dust in a very small pile of games that I intend to go back to at some stage.

Also from **Origin** comes one of the bargains of the year with the *ULTIMA TRILOGY* in which the equally unimaginatively named *Ultimas I, II* and *III* are bundled together. These games look more than a little hit crude now but there is still a lot of role playing here for your money.

Silliest game of the year was without doubt *ZAK McCRACKEN AND THE ALIEN MINDBENDERS* **Lucasfilm Games** from **Activision**. This animated graphic adventure requires no text input relying instead on menus and incons. The story istelf is a spoof on newspapers such as the Sunday Sport. The plot involves stupidity waves being passed down telephone wires together with two headed squirrels and beach buggies on Mars. Enough said.

The only text only adventure to come my way this year was from a mail order company, **Big Sky Brothers,** 35



```
>>>W
Most of the top floor of the mansion has
been torn out and a large laboratory
installed.  Magical paraphernalia
litters the room: filthy retorts bolted
to benches poison the air with chemical
obscenities, coils of polymer tubing
twine among stoppered flasks and
alembics, astronomical charts overlap
astrological data sheets on the walls.
A shining silver machine fills the west
wall, covered with jutting circuit
boards (among them a huge fromitz board
held by flathead screws) and sprouting
cables.  Connected to the machine by a
complex semi-organic interface is a Time
Portal.
Under one bench is a mahogany chest.
It is bound with chains and has a red
triangular label.
You can see a Fit-U-Fine Scanning
Helmet.
>>>EXAMINE HELMET
```

Old Evanton Road, Dingwall, Ross, IV15 9RB. *TIME THIEF* involves the perils of a magician's assitant as they try to unravel the problems caused when their boss' monopoly in time share holidays annoys his fellow wizards. At only £5 including p and p (UK only), this is definitely my budget adventure of theyear.

As far as graphic adventures go, then look no further than *SCAPEGHOST* reviewed elsewhere in this column.

Finally, my game of the year is *CURSE OF THE AZURE BONDS*, the second title in the Dungeons and Dragons series. The gameplay has improved considerably on Pool of Radiance and the characters themselves are now powerful enough to introduce considerable variety into the game.

For example, where beofre you had to fight endless battles against thirty plus goblins, all of which you know you were going to win given time, in Curse, you are facing up to fewer but more potent monsters who will cast powerful spells back at your. Consequently, you have to think carefully about every move that you make and this extra element of strategy adds considerably to what was already a pretty good game.

Well there you are. That's my choice for my favourite games. No doubt you disagree so why not write in and let me have your list? It can be games released over the past year or your all-time favourites. The best letters will be published and if enough of you write in, we will have a go at compiling an all time top ten adventure list.

ULTIMA V – HINTS AND TIPS

Response to my plea for hitns for this game was somewhat underwhelming with only two letters. My thanks therefore to **M. Hieralal** from Rotterdam in Holland and **Mrs Doreen Sellman** of the Isle of Wight who, on the toss of a coin, wins the prize.

1. Elevation of your character comes automatically when you have sufficient experience and hole up and camp

2. Before you enter the underworld, you will need to meditate at each of the shrines having first leanrt the appropriate mantra. Then sail south east to the Guardians of the Isle

3. Watch where Shenstone goes at noon each day in order to obtain skull keys

4. To get the sandalwood box from the secret compartment, play 678-987-8767653 on the harpsichord

5. Access to the resistance group requires the password 'dawn'

6. Access to the Oprression group requires the password 'imperium'

7. The names of the Shadowlords are Falsehood – Faulinei, Hatred – Astaroth and Cowardice – Nosfentor

8. Five of the eight passwords for entering the dungeons are Fallax, Infama, Vilis, Malum and Avidus

9. The potions have the following effect: green posions the user, yellow heals, purple turn you into an animal in combat, black turns you invisible in combat, white gives off light, organe puts you to sleep, blue wakes you up and red cures poison

10. When talking to someone, the following keywords should be tried: name, job, mantra, shrine, virtue, word, resistance and oppression. Other words can be tried according to the answers given. For example, ask the Lord of Empath Abbey about mountains in order to get the grapple

11. In order to destroy the Shadowlords, you will need to find the three shards and destroy them in the flames of truth, love and courage.

MYTH

As mentioned last month, this adventure is not available in the shops, but is sent to you free when you subscribe to the **Official Secrets Club.**

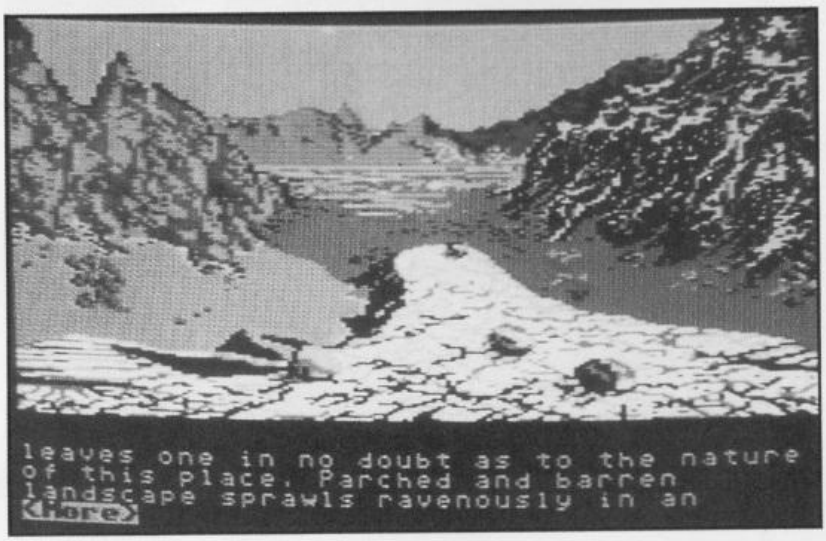
In the middle of a temple warming party, Zenus informs you that the religious monopoly of the Pantheon is under threat from new groups such as the Christians. 'It is the time that something was done' he continued and promptly pointed his finger at you, Poseidon, to take charge of the first task. And all this before you even had the chance to organise a sick note!

Your task is to steal the helmet of invisibility from Hades' throne room. Just to ensure that you do it properly, all your godly powers have been removed.

The game is a humorous romp through classical mythology. If you are familiar with the Magnetic Scrolls style, (games such as the Pawn and Guild of Thieves) then you will know just what to expect. If you are unfamiliar with this company's work, then the image of Poseidon, God of the Sea wearing water wings because he can't swim should give you some idea.

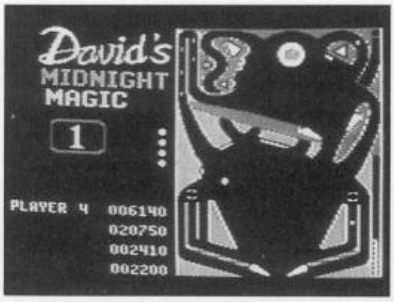
In addition to Myth, subscribers also get a free copy of **Level 9**'s *Gnome Ranger* (or an alternative if they already possess that game) and six issues of glossy magazine devoted to adventures, role playing games and other programs requiring at least a modicum of intelligence. There is a helpline whcih you can telephone six days a wekk for a hint on over 500 different games and contact with over 3000 like-minded adventurers. Finally, you also get access to heavily discounted mail order software.

Subscription to Official Secrets costs £22 for one year and further information can be obtained by 'phoning either Tony Rainbird of **John Trevillian** on 0279 726541.



1st CD EDITION

Gordon Hamlett casts his critical eye over the compact disk



Have you got a disk drive? Of course you have, you wouldn't be reading this magazine otherwise. But what sort of drive have you got? I know that this sounds like a silly question but consider how the disk drive has evolved over the last few years.

Whereas home and small business micros have come on in leaps and bounds, there have been very few changes as far as disks and disk drives go. The old favourite has always been the 5¼ inch floppy which works very well until you accidentally sit on one or spill your coffee all over it. The 3½ inch disk as used on the Amiga is considerably more robust but is still prone to a Maxwell House attack.

What then are the alternatives? One possibility that has been mentioned in the press for some time now has been the compact disc as used in your hi-fi system. These discs are fairly robust and immune to dust and fingerprints. In theory, even bits of jam can be wiped off with no ill effects although this is not a recommendation to go and try it with your favourite bit of Mozart.

All this sounds great but as in life, there is no such thing as a free meal. Using compact discs, there is one very major drawback. You cannot write to them – they can only be read from. This is something that may well change in the future but at the moment, using a compact disc as your storage medium is totally pointless if you want to do any word-processing or update your accounts et cetera.

There is however, still considerable potential for using CDs, even in a read only form. Because each CD is capable of storing a phenomenal amount of information – much more than a conventional floppy, it means that large, multi-volume books can be easily stored. Imagine the complete **Oxford English Dictionary**, thirteen volumes plus supplements on a couple of disks. Or the **Bible**. Or **Encyclopaedia Britannica**. The combination of saved space coupled with immediate access to the information desired is a very attractive proposition indeed. And with the ever increasing need to save paper, the electronic book becomes a distinct probability.

Of course, another type of read only information comes in the form of games and this is where fiction becomes reality. Rainbow Arts has released a compilation of ten games entitled 1st CD edition.

Setting up the system is simplicity itself. An adaptor plugs into the cassette port of the C64. A phone to phono lead then connects the computer with the CD player and that is all there is to it. Should you have trouble loading from one channel, then try the other one. If that still fails to load, the games are recorded a second time twenty tracks further on again on both left and right channels so that you have a total of four attempts to load each program. Games take about thirty seconds to load once the correct track has been selected.

There are also ten audio tracks featuring the music of **Chris Hulsbeck** which can be played on your hi-fi system as normal. As this type of synthesised noise is not my particular cup of tea, I shall refrain from further comment save to say that the 'music' starts at track 14, a fact not mentioned in the instruction manual.

The games themselves are all golden oldies although some are more golden than others. No doubt, if this format takes off, then more recent releases will feature in future compilations.

David's *Midnight Magic* is still my favourite pinball game. Nothing too complex but highly addictive for up to four players. *Dropzone* is a very good Defender variant – rescue the men on the planet who are being kidnapped by alien spacecraft.

Fist II combines martial art action with an arcade adventure setting – find scrolls, meditate in temples and destroy the evil warlord. Impossible Mission has to be one of the all time classic games on the 64, a heady mix of superbly animated platform action and puzzle solving. This was also one of the first games to feature decent speech synthesis and the phrase 'Destroy him my robots, destroy him... forever' still sends a tingle down the spine.

Leader Board is an excellent golf simulation, much copied but never bettered. *Lode Runner* features 150 levels of ladders and platforms and if that isn't enough for you, there is also an on screen editor. *Mission Elevator* sees you searching every room in a 62 floor looking for codes that will help you disable a bomb whilst simultaneously dodging the bullets from a whole host of gangsters.

Solomon's key is another platform variant although with overtones of *Boulderdash*. Not one of the better games on the disk. Nor is *Jinks* which tries to combine a breakout game with pinball and fails miserably on both counts. Never mind, quality is restored in the final game, *M.U.L.E.*, a multi player strategy game in which you must both explore your surroundings and develop your resources.

OK, so the games are a bit long in the tooth, but that is not really what is important here. I suspect that discs of games probably won't catch on but I believe tht the possibilities for this system purely as a data storage facility are endless.

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BUDGET REVIEW

It is not often that budget games appear on disk, except for compilations, and so I was interested to find five releases on the **Encore** label from **Elite.** Unfortunately, the games are a decidedly mixed bunch and there is only one that I would consider adding to my collection.

Starting at the top, the pick of the games is undoubtedly *BombJack II.* Although not as good as the original, this is nevertheless a highly playable platform variant. Jack has to make his way round forty different screens alternating between backdrops of a reptile infested lava pit to outer space.

Each screen consists of a number of platforms which contain bombs and or patrolling monsters. You have to collect the bombs – with a bonus life if you can manage to pick them all up in the correct order – without allowing yourself to be caught. You have a limited defence against the bad guys in so much as you stab them and force them off the platforms before they do likewise to you. And that's really all there is to it. Simple but quite addictive.

From here, things starts to go rapidly downhill. *Storm Warrior* has never been released before and you can see why. The gameplay is not quite right.

You play the part of your local prince and as such, it is your duty to rid the land of a curse bestowed on your people by the evil witch queen. You must wander through the land until you come to her castle before defeating her once and for all.

The game itself is a bog standard beat-em-up. High slash with your sword, medium slash and kick – you know the sort of thing. The animation is crude. Positioning on screen is critical – you can't hit your opponent if he is too close – and there are all sorts of problems when you have two opponents on the same screen to fight. There are better games of this type around.

Turbo Esprit is an old Durrell game in which you drive your high performance car at great speed round one of four cities in an attempt to catch roving gangs of drug smugglers.

There are several problems with this game. Small graphics for the cars are not very appealing and what there is moves so slowly, you feel that you would be better off on foot. You also have to find the criminals in the first place from a map of the city together with intelligence reports. This takes so long with the funeral scrolling rate that you lose all interest long before you're even close to them. Then there is the problem of realism. If you are involved in a high speed car chase round the city with guns blazing, the last thing you are going to do is stop when the traffic lights turn red. No, *Turbo Esprit* features too little action too late.

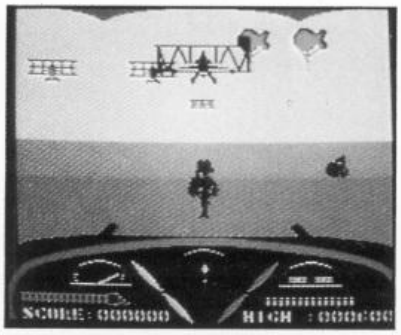
Deep Strike is a World War I dogfight shoot-em-up. It is also not very good. You are attempting to escort four bombers to a target way over enemy territory. Against you are the triplanes of the Red Baron's squadron, lots of anti-aircraft guns that have the amazing ability to only hit enemy planes and some decidedly modern looking tanks.

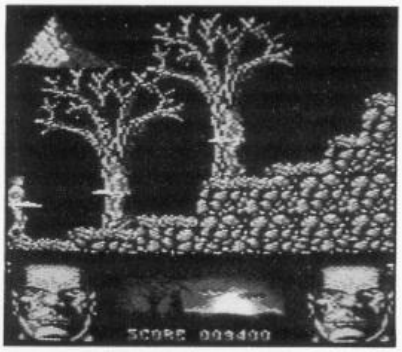
You can defend yourself of course but should you choose to do so, your ammunition runs out very quickly so you are forced to resort to trying to pick off enemy planes with single shots from your machine guns. You can drop bombs yourself (which begs the question of what you are doing escorting bombers in the first place), but the bombs will only drop when you fire your guns which you cannot really afford to do. The head on 3-D perspective does not work particularly well either but that is almost an irrelevance with the poor gameplay.

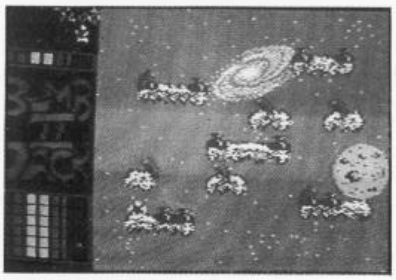
The final game is a real blast from the past, *Kokotoni Wilf,* one of the first games that I ever saw on the 64. I have to say too that it has not really improved with age. It looks and feels very, very dated. You are searching for fragments of the lost Dragon Amulet which have been scattered throughout time.

The game itself is a very crude arcade adventure. Explore the mini mazes, collect the fragments, avoid colliding with anything nasty, find the time gate and then on to the next section. It might have been good back in 1984 but by today's standards, I have seen better listings.

Not a very good selection then, I could understand perhaps if this little had been bundled together but as things stand, with the possible exception of *BombJack II,* I think that I would experience a sense of having been ripped off if I had bought any of these games today.





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